The adoption of learning management systems (LMS) among faculty members at Kansas State University and King Saud University

by

Tariq Alshalan

B.S., King Saud University, 2008
M.S., Western Illinois University, 2014

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Curriculum and Instruction
College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2019

Abstract

The purpose of this quantitative study was to investigate three areas related to LMS adoption at universities: first, the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experiences) and their adoption of learning management systems (LMS); second, organizational support related to LMS adoption; and third, concern of time and fear of technology as inhibiting factors of using an LMS.

The research compares faculty members at Kansas State University, Manhattan, Kansas, and faculty members at King Saud University in Saudi Arabia. This study is related to the educational technology field in the higher education environment. Many universities in Saudi Arabia are in the early stage of adopting and using e-learning tools such as LMSs. There is a need to illustrate the best practice processes of adopting new technology in higher education contexts. This study should help instructors and university leaders determine the significant factors of successful adoption of educational technology tools.

Rogers' (2003) diffusion of innovation theory was used to provide insights and guide the study as well as design the research questions. His work mentioned that about 49% to 87% of innovation adoption can be predicted according to five perceived attributes: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, (5) observability.

These data were obtained from 403 faculty members at Kansas State University. The data analysis showed that faculty members' personal characteristics influenced their LMS adoption. A MANOVA Pillai's Trace test results showed a statistical difference between faculty characteristics (age, $p = .017$ gender, $p = .009$ years of teaching experiences $p = .042$ and academic rank $p = .000$) and Rogers' five attributes of innovation at Kansas State University.

Conversely, at King Saud University the data were obtained from 104 faculty members. The data analysis showed no influence between faculty members' personal characteristics and Rogers' five attributes of innovation.

An ANOVA test was conducted and there was a statistical difference among faculty members at Kansas State University in all four independent variables (age, $p = .004$ gender, $p = .000$, years of teaching experience $p = .012$ and academic ranking, $p = .008$) and their perception of the organizational support related to their adoption of the LMS. On the other hand, there was no a statistical difference among faculty members at King Saud University in all four independent variables (age, gender, academic ranking, and years of teaching experience) and their perception of the organizational support related to their adoption of the LMS.

The MANOVA Pillai's trace test result showed a statistical difference between faculty academic rank and fear of change of technology $p = .021$ and no statistical significance for time concern at Kansas State University. However, there was no a statistical difference for faculty members at King Saud University concerning all independent variables (age, gender, academic ranking, and years of teaching experience) with fear of change of technology and no statistical significance for time concern, as well.

The study concluded with a recommendation for Kansas State University and King Saud University regarding learning management system adoption. In addition, important considerations for professional development and training among faculty members were also recommended. Finally, a recommendation for future research in the field of educational technology was proposed.

The adoption of learning management systems (LMS) among faculty members at Kansas State University and King Saud University

by

Tariq Alshalan

B.S., King Saud University, 2008
M.S., Western Illinois University, 2014

A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Curriculum and Instruction
College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2019

Approved by:

Major Professor
Dr. J. Spencer Clark

Copyright

Abstract

The purpose of this quantitative study was to investigate three areas related to LMS adoption at universities: first, the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experiences) and their adoption of learning management systems (LMS); second, organizational support related to LMS adoption; and third, concern of time and fear of technology as inhibiting factors of using an LMS.

The research compares faculty members at Kansas State University, Manhattan, Kansas, and faculty members at King Saud University in Saudi Arabia. This study is related to the educational technology field in the higher education environment. Many universities in Saudi Arabia are in the early stage of adopting and using e-learning tools such as LMSs. There is a need to illustrate the best practice processes of adopting new technology in higher education contexts. This study should help instructors and university leaders determine the significant factors of successful adoption of educational technology tools.

Rogers' (2003) diffusion of innovation theory was used to provide insights and guide the study as well as design the research questions. His work mentioned that about 49% to 87% of innovation adoption can be predicted according to five perceived attributes: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, (5) observability.

These data were obtained from 403 faculty members at Kansas State University. The data analysis showed that faculty members' personal characteristics influenced their LMS adoption. A MANOVA Pillai's Trace test results showed a statistical difference between faculty characteristics (age, $p = .017$ gender, $p = .009$ years of teaching experiences $p = .042$ and academic rank $p = .000$) and Rogers' five attributes of innovation at Kansas State University.

Conversely, at King Saud University the data were obtained from 104 faculty members. The data analysis showed no influence between faculty members' personal characteristics and Rogers' five attributes of innovation.

An ANOVA test was conducted and there was a statistical difference among faculty members at Kansas State University in all four independent variables (age, $p = .004$ gender, $p = .000$, years of teaching experience $p = .012$ and academic ranking, $p = .008$) and their perception of the organizational support related to their adoption of the LMS. On the other hand, there was no a statistical difference among faculty members at King Saud University in all four independent variables (age, gender, academic ranking, and years of teaching experience) and their perception of the organizational support related to their adoption of the LMS.

The MANOVA Pillai's trace test result showed a statistical difference between faculty academic rank and fear of change of technology $p = .021$ and no statistical significance for time concern at Kansas State University. However, there was no a statistical difference for faculty members at King Saud University concerning all independent variables (age, gender, academic ranking, and years of teaching experience) with fear of change of technology and no statistical significance for time concern, as well.

The study concluded with a recommendation for Kansas State University and King Saud University regarding learning management system adoption. In addition, important considerations for professional development and training among faculty members were also recommended. Finally, a recommendation for future research in the field of educational technology was proposed.

Table of Contents

List of Figures

List of Tables

Acknowledgements

Gratitude is expressed to Almighty God for his blessings and for giving me strength and courage to finish the work in this dissertation. All thanks are due to Allah. None of this would have been possible without God's blessing grace and mercy.

I acknowledge, with deep gratitude and appreciation, the inspiration, encouragement, valuable time, and the continuous guidance given to me by my Major Professor, Dr. J. Spencer Clark. I simply cannot begin to imagine how things would have proceeded without his help. He made me confident in my abilities and gave me determination to work towards my goal.

Also, I was fortunate to have had a solid committee of faculty members who understood my desire to research and study in the field of learning management systems for teaching and learning: Dr. Kay Taylor, Dr. Be Stoney, and Dr. Mickey Loisinski. Thank you all for your feedback and ideas that made my dissertation better. Also, I am glad to have had Dr. Rebecca Gould, the director of the Information Technology Assistance Center, on my final committee. Your feedback as one of the first users of Canvas LMS at Kansas State University added significant information to my dissertation. Also, I would like to thank Dr. James Teagarden for agreeing to be on my final dissertation committee.

Finally, I am also thankful to Dr. Todd Goodson for the support and time that you offered me. When I had problems, you always opened your door to me. Thank you also to Dr. Deepak Subramony, who helped me through my dissertation journey in the field of Educational Technology.

Dedication

My love and gratitude go to my parents, my father Mohammed Alshalan and my mother Daleal Alsallom, for laying the foundation for success in my life. I really appreciate their efforts, and I hope that my achievements will make them proud of me. I am also thankful to my brothers and sisters for all of their support.

I am grateful to my wife and soulmate, Ghaida, for completing my life by sharing it with me, and to my sons, Ziad and Mohammed, for making me smile during my dissertation journey.

Chapter 1 - Introduction

Chapter Overview

This chapter presents an overview of the research study, beginning with a change in the higher education setting and the way learners are receiving information. The impact of the internet in our life and higher education especially. Next, the history of learning management systems and the definition is provided. Additionally, overview of diffusion of innovation theory, the statement of the problem, purpose, and research questions are addressed. In addition, the significance of the study and delimitations are presented as well as the definition of terms.

The goal of the study was to investigate the relationship between faculty personal characteristics (age, gender, years of teaching experiences, academic ranking) and their adoption of learning management systems (LMS) at Kansas State University, and compare that with faculty members at King Saud University in Saudi Arabia.

Higher Education Changes over Time

E-learning environments have become an important learning option because of the increase of accessibility in the digital age to information and knowledge. This has required instructors to update their pedagogies to meet the demands of new teaching and learning trends. Additionally, the role of teachers expands since the emergence of the internet in the field of education (Chang, 2008). Moreover, higher education is constantly changing, new demands in the higher education system include “reshaping, redesigning, and re-visioning traditional teaching and learning relationships" (Georgina & Olson, 2008 p.3) and these changes are related to the faculty members’ adoption of new technology.

As students change, the purpose and pedagogy of education change as well. In fact, “our students have changed radically. Today’s students are no longer the people our educational

system was designed to teach" (Prensky, 2001, p. 1). One significant area of change is in learning materials, especially as universities turn more to the use of technology. A study by Shayo, Mwase, and Kissaka, (2017) mentioned that higher education institutions have transformed the teaching and learning process from a behaviorist paradigm to a communicative paradigm by using Information and Communication Technologies (ICT) tools. The advantages of ICT in higher education include an increase in learning motivation, learning satisfaction and instructional effectiveness (Mwase, & Kissaka, 2017). Similarly, a study by Asiri, Mahmud, Bakar, and Ayub (2012) stated that the fast growth of ICT and usage of e-learning tools like learning management systems (LMS) have become essentials for learning and teaching processes. Universities adopted LMS for different advantages, such as improving the quality of learning and allowing learners to be active. In addition, instructors and students do not face time and space limitations because communication can occur outside the classroom by using LMS platforms. Nowadays, learners have more options that allow them access to their classes and learning materials from anywhere and anytime. According to Hong-Ren and Hui-Ling (2010), "People are using wireless technology more often because information retrieval can occur anytime or anyplace" (p. 70). To adapt to this change in culture, higher education institutions have been changing the way they deliver information, integrating technology throughout teaching and learning by using learning management systems (LMS). These systems change the way students are learning and receiving knowledge (Coates, James, & Baldwin, 2005), and have an ongoing role in higher education's facilitation of courses.

Internet and Higher Education

The internet has become a powerful learning environment for higher education. The new life style of learners requires educators to develop appropriate teaching methods, such as

internet-based education (Ozkan, 2010). According to Ehlers and Schneckenberg (2010), "The number of internet users was approximately 500 million worldwide in 2003 and doubled by 2005. This opportunity to network and access information is a significant change in the way people approach, use, and share information" (p.140). In 2019, the number of the internet users in the world was more than 4 billion (Internet World Stats 2019).

In addition, online learning has opened more learning opportunities for higher education students. However, universities' leaders should move to a new level of learning and teaching that meets the learners' demands. In order to achieve that, leaders need to understand the technology changes and have a desire to adjust university policies to adopt new learning approaches such as blended learning or online learning (Garrison, & Kanuka, 2004). Moreover, the improvement of ICT is one of the important reasons to use online tools for education purpose. There are some issues with traditional face-to-face classroom such as limited time for interaction between students and instructors. As well as providing faster feedback to the learners when they are outside classroom, using eLearning tools would help faculty members to solve these issues by allowing learners to have chance to received feedback after class time (Vernadakis et al., 2012).

Additionally, the development in mobile technology has increased the use of the internet. A study by Uzun (2014), which focused on utilizing technology for intercultural communication in virtual environments, observed that though many students may not have personal computers, it was rare to find a student without a mobile device. A lot of companies provide features for smartphones that encourage individuals to use the internet on these devices. In addition, many websites provide mobile views that make searching and other tasks easier for those using mobile devices.

A survey on higher education students done by the Education Center for Applied Research in 2012 found that 67% of surveyed students believe their smartphone devices are essential to success in their academic life. Moreover, learners are pushing the adoption of computing devices to include computers, tablets, and smartphones in the higher education environment. The increased use of these devices on university campuses give instructors the opportunity to deliver more information and knowledge to students (Gikas & Grant, 2013).

Policy makers in higher education need to recognize the changes in communication trends. For instance, using an LMS for learning and communication allows students to check their class materials from their smartphones. In addition, an LMS helps users stay organized. Instructors and students both can manage activities and grades through an LMS. It also provides useful and efficient communication features such as automatic notifications of due dates and tools that facilitate discussion and group projects (Rubin et al., 2010).

The History of Learning Management System

Later sections of this paper will examine K-State's use of its chosen LMS (Canvas); first, however, a general overview of LMS history will be provided. The first learning management system was launched by the University of Illinois in 1960, and it was called Programmed Logic for Automated Teaching Operations (PLATO). The system included different features that improved online communication for learners and faculty. In 2006, the Plato LMS was discontinued (Kumar, Gankotiya, & Dutta, 2011).

At the end of 1990, many companies became interested in providing learning software for higher education institutions. Learning management systems were created by Blackboard, Angel, WebCT, and other companies. These were the most common systems used by universities and were customizable (Malm & Defranco, 2012). According to Coates, James, and Baldwin (2005),

the "LMS grew from a range of multimedia and internet developments in the 1990s" (p. 20). There were many terms used to describe the early versions of learning management systems such as computer assisted instruction (CAI), computer assisted learning (CAL), and integrated learning system (ILS) (Watson & Sunnie, 2007). The improvement and development process is ongoing in the field of LMS in order to provide users with better experiences. As stated by Çeliköz and Erdoğan (2017), "Learning Management Systems, which are used in the field of education and considered as one of the effective learning tools (LMS), have a great importance especially in higher education and in the last decade, they have been used by almost all educational institutions" (p. 243). In the last decade, the adoption of LMSs in higher education has been an important component of information technology that has improved the teaching and learning field (Coates, James, & Baldwin, 2005).

Higher education institutions adopted LMS software to make the teaching process more effective. One way that LMS use can help facilitate the teaching and learning process is the ease of communication it provides. Communication and interaction between students, an instructor, and other learners is made much easier with the use of an LMS. Built-in email systems, chat rooms, and other discussion tools create efficient and seamless communication (Lonn & Teasley, 2009).

An additional benefit of an LMS is the great opportunity it provides for instructors to deliver learning in innovative ways and account especially for students' varying learning needs and preferences. It also enables and facilitates a learning community wherein instructor and students learn from each other and the learning is more student-directed than instructor-directed. The view of education as top-down (instructor to student) is outdated, and an LMS provides tools that allow instructors to adapt to this change. According to Coaldrake & Stedman (1999), "Many

academics will have to confront the reality that the task of the academic teacher, traditionally encapsulated in the designation of 'lecturer', is shifting from the transmission of information towards the management and facilitation of student learning" (p. 7).

Learning Management Systems

Many studies provide definitions for LMSs. According to Alias and Zainuddin (2005), an LMS can be defined as "a software application or web-based technology used to plan, implement, and assess a specific learning process" (p. 28). Another definition by Sallum (2008) describes an LMS as a solution that allows instructors and administrators to deliver content and resources to all learners and staff. Sanga (2016) notes that "Internet-based learning management systems (LMSs) such as Blackboard, Moodle, WebCT, Canvas, Scholar, and Desire2Learn are some of the popular internet technologies that support distance, face-to-face, and hybrid/blended teaching-learning processes" (p. 11). Since most systems are web-based, learning materials are available 24/7, which facilitates learning (Black, et al., 2007). Users have access to all of a course's lessons as well as many other online resources and activities (Çeliköz, & Erdoğan, 2017).

In addition, an LMS helps users stay organized. Instructors and students both can manage activities and grades through an LMS. It also provides useful and efficient communication features such as automatic notification of due dates and tools that facilitate discussion and group projects (Rubin, et al., 2010). Most, if not all, educational institutions, especially at the university level, now use LMSs to provide students with a space for online learning.

Kansas State University

Kansas State University is the first public university in Kansas; it opened in 1863 as the state's land-grant college. KSU's main campus is in Manhattan, Kansas, in the United States.

According to the About K-State page, K-State had an enrollment of 19,472 undergraduates and 4,307 graduate students in 2016-2017. It is known for research and its campus life and is a place of diversity; in addition, it is a welcoming community for international students. K-State offers a variety of academic majors including graduate certificates, master's degree programs, doctoral degree programs, and 250 undergraduate majors. In addition, K-State has more than 1,437 full time faculty members, many of whom are nationally recognized for their research (About K-State, 2017).

The United States higher education system encompasses about 4,500 college universities with more than 20 million students and 1.4 million faculty members. This has encouraged many students from different countries to study at universities in the United States (Bok, 2015). As reported by Lonn and Teasley (2009), more than 90% of American universities and institutions have adopted LMSs for student and faculty use. The impact of an LMS on students and faculty members' interaction outside the classroom is one of the most powerful features that an LMS offers to users such as allowing instructors to communicate with students. Additionally, students describe their experience with an LMS as an effective learning tool to save their time (Lonn , Teasley, 2009).

Kansas State University and LMS

Kansas State University has experience with several types of LMSs. The system before Canvas was Axio, and the current system is Canvas. Moreover, the College of Education used Blackboard LMS in 1998; the College of Education began the transition to K-State Online Axio system in 2004. The university has more than 25 years' experience with different LMSs (D. Devenney, personal communication, October 31, 2019). The Axio learning management system was used by K-State Online at Kansas State University for 16 years. While K-State continuously

improved the LMS, there were features and expectations requested from the university users that made it no longer feasible to continue to upgrade Axio. K-State users were looking for a new system that had better features and improve their experiences. The system became increasingly difficult to work with, so K-State started looking for a new LMS that would meet the university needs. (K-State Today, 2014)

Goins (2017), from the information technology help desk, described the steps K-State took to select the new LMS. In Fall 2013, K-State began the process of choosing a new learning system for the university. The K-State Online Advising Committee, including faculty and students, tested different systems, including Blackboard and Canvas. According to the positive feedback from the users, the university continued the experimental use through the spring and into the summer of 2014. During the pilot sessions, informal training was offered along with monthly newsletters to instructors. As stated by S. Finkeldei (2017), K-State Online coordinator, Canvas was selected as the learning management system for Kansas State University based on three reasons;

1. Canvas pricing model was affordable for K-State.
2. Canvas features and functionality were well matched to the specific system it was replacing at K-State.
3. The specific flexibility Canvas provides with the Learning Tools Interoperability (LTI) tool framework, its robust API and third party toolsets, and ability to customize key items in other ways made it the best product to be successful for the integrations with existing K-State systems. (S. Finkeldei, personal communication, October 6, 2017)

The official announcement about using Canvas as the LMS for K-State was on July 10, 2014. Canvas was chosen to make teaching and learning easier for K-State users. Canvas allowed instructors to plug in third-party collaboration tools like Kahn Academy, Google Docs, Mediasite, YouTube, and Twitter, along with other social media and learning tools. Additionally, it offers integration with textbook publishers that allows the instructor to use the chapter test banks. Instructors can import directly into Canvas by creating quiz files.

Moving to a new system requires preparation and training. For this reason, the Canvas Communication, Training, and Implementation team developed a multi-faceted transition plan designed to build the loyalty of the campus community. During the fall of 2014, the system was made available to all instructors as the first part of a three-phase transition from an LMS that the university had trusted for more than 16 years.

Training was provided to prepare instructors who were interested in upgrading their current courses from Axio Classic to Canvas for the Spring 2015 semester. The training program included 90-minute face-to-face sessions. First, faculty had a 20-minute orientation, and then selected unique features offered by Canvas were highlighted. Furthermore, technology trainers gave instructors access to an actual Canvas course as a student. The course was designed to be used in conjunction with the face-to-face training, as well as a permanent resource for Canvas related questions. Participants were encouraged to navigate the Canvas interface, explore the tools available, participate in discussions, complete activities, and practice quizzes. They were even given a homework assignment that required them to create their own Canvas course with content (D. Goins, personal communication, September 13, 2017).

Training and support for faculty are fundamental components to success with using LMS in higher education. The users must master technical skills that help them to use the new learning

tool in appropriate, effective ways (Raphael & Mtebe, 2016). In addition, universities must take into consideration the adaption of new software and hardware before using them in the learning process. For example, instructors need technical support while they are implementing course materials in the LMS (Taylor & Newton, 2013).

Figure 1.1 Canvas Page (Canvas.com, 2018)

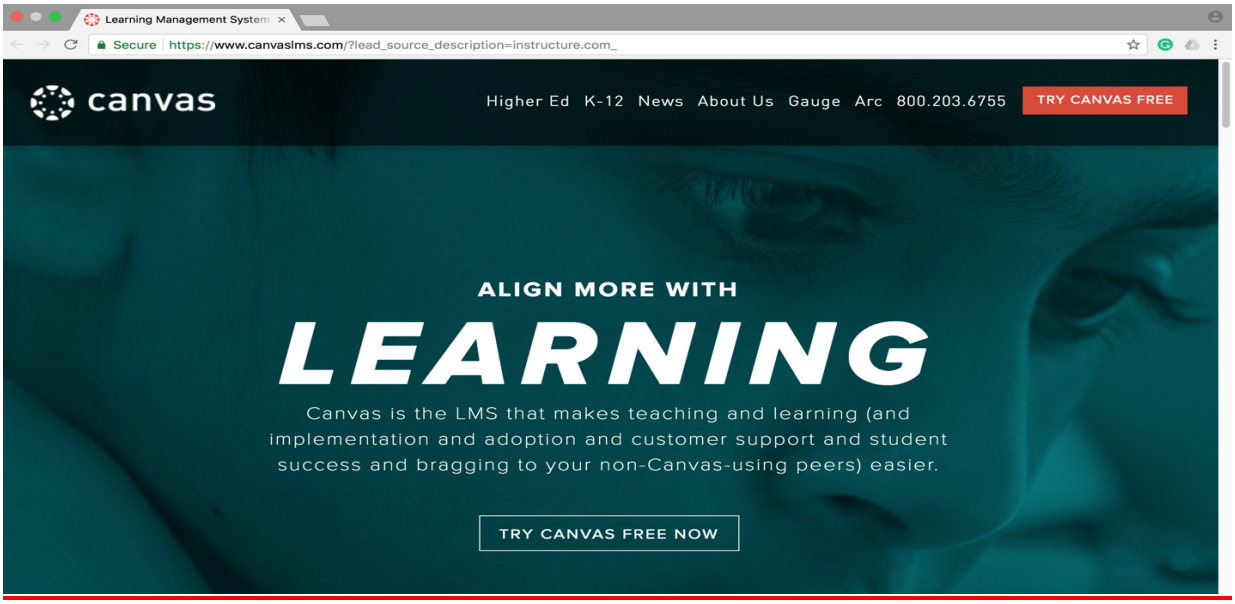
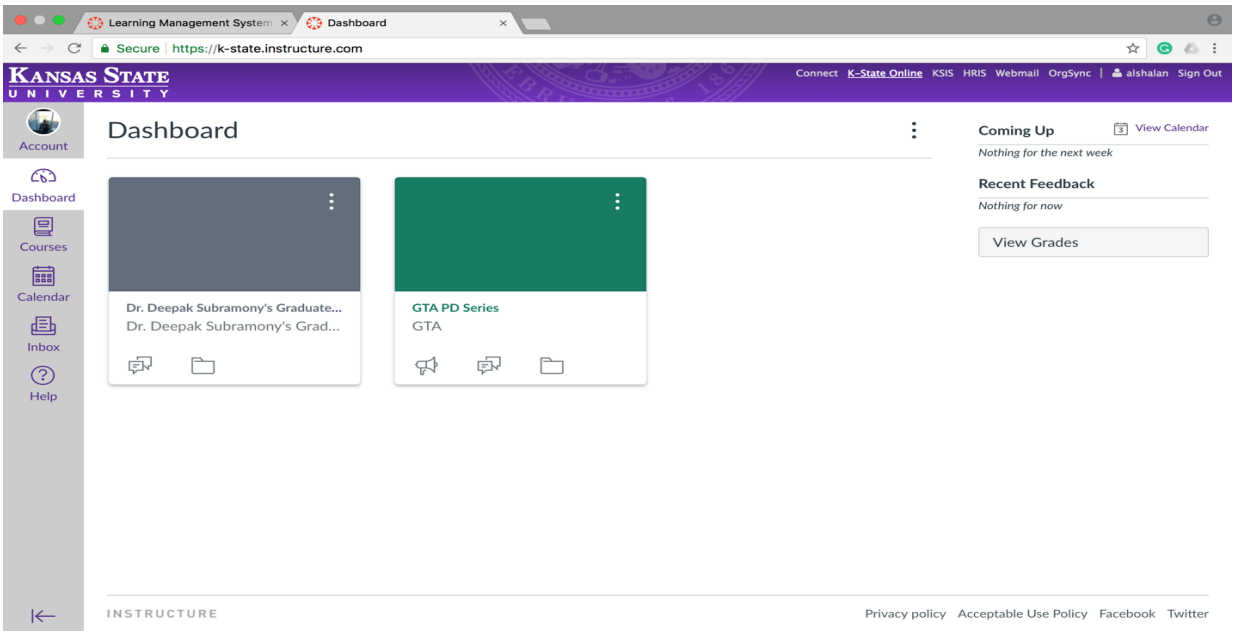


Figure 1.2 Student Page (K-State, 2018)



King Saud University

King Saud University is a public university in Riyadh, Saudi Arabia, founded in 1957 as the first university in Saudi Arabia. College of Art was the first discipline in the 1957. Currently, the university has students' enrolment over 62,000 studying in 19 colleges that cover different education field such as, natural sciences, humanities, health. In addition, the university Faculty member are more than 7,000 between male and female in different positions from Professor, Associate Professor, Assistant Professor, Lecturer and Teaching Assistant. (Ministry of Education, 2016)

The increased student enrollment pushed the university to offer a new way to improve the communication process between instructors and students. Deanship of E-Learning and Distance Learning was established in 2007 one of their important goals is to train faculty and students to use e-learning system at King Saud University beside managing e-learning systems. The university uses Blackboard as learning management system to delivery online materials (Omar, 2016).

Figure 1.3 Blackboard Page (KSUBlackboard LMS, 2018)

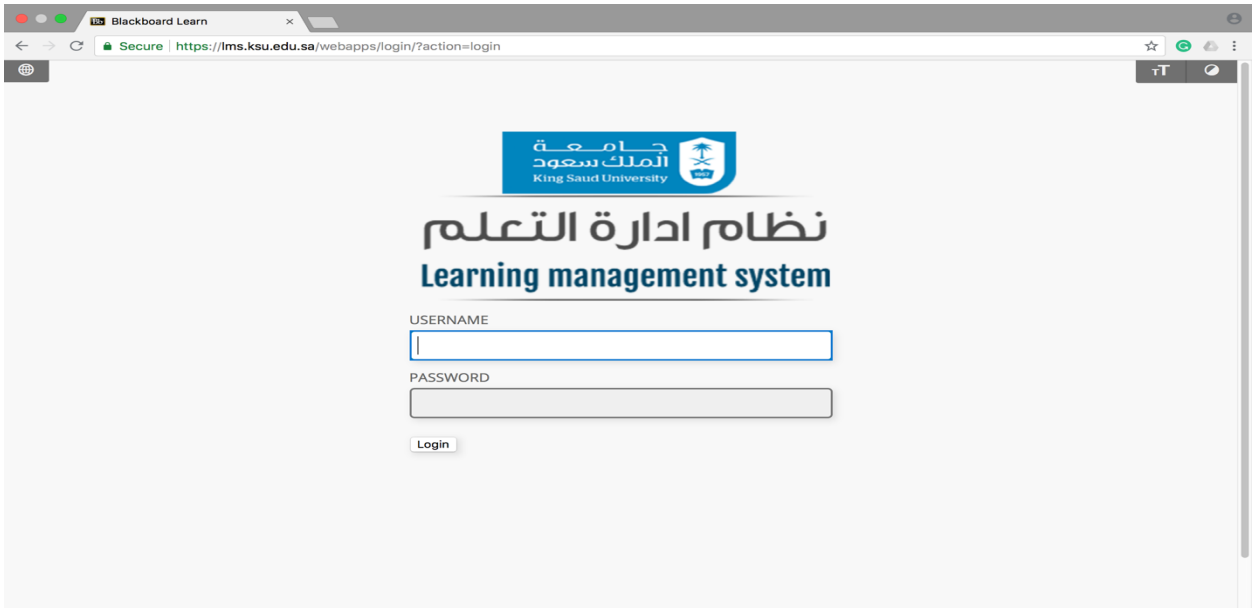
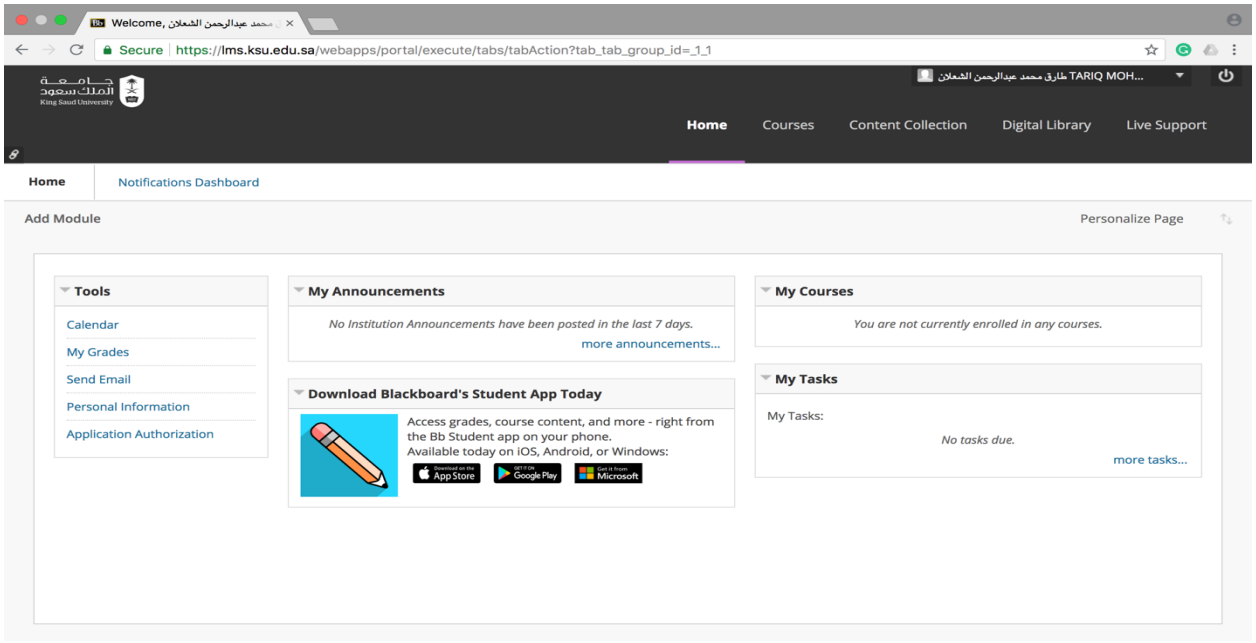


Figure 1.4 Instructor page for Blackboard (Lms.Ksu.edu.sa, 2018)



Blackboard at King Saud University

Many studies try to investigate the distance learning improvement at Saudi universities. A study by Alturki, Aldraiweesh and Kinshuck (2016) attempted to evaluate the usability and accessibility of Blackboard LMS at King Saud University. The study sample was 400 faculty members, including males and females. Prior knowledge and experience with an LMS played an important role to determine the effectiveness of the LMS platform. Moreover, faculty members at King Saud University faced difficulty when utilizing and exploring the features of the LMS platform because of the lack of experience with this system. Similarly, Bousbahi and Alrazgan (2015) investigated the Information Technology Department's faculty resistance to adopting an LMS at King Saud University with 20 participants and a 40% adoption rate. The study focused on the female faculty members; the findings were interesting because most of the respondents were not using most of the Blackboard features, which stemmed from a lack of training and time to explore the LMS. In addition, poor internet connection was one of the common problems they

faced while using the LMS. Another study by El Zawaidy (2014) conducted at three universities in Saudi Arabia, which were King Saud University, King Khaled University and Taif University. The main goal of the study was to find out the challenges and difficulties that prevent faculty members from using the Blackboard learning management system effectively. The study found that faculty members who faced problems with the LMS shared common issues. First of all, the users faced a lack of training and experience when using Blackboard systems. Secondly, the lack of knowledge related to new technology was another reason for their limited use of the LMS. Thirdly, poor internet connection was another barrier among faculty members at these three Saudi universities. The percentage of faculty and students using the learning management system in 2015 according to the Deanship of e-Transaction and Communication at King Saud University is illustrated in the tables below.

Table 1.1 The Percentage of Faculty Member Use of Blackboard LMS

Faculty members Use of Blackboard LMS	**Number and Percent**
Female faculty members	1314
Male faculty members	2387
Female users of the system	692
Male users of the system	1174
Total faculty members	3701
Percentage of female faculty members' use of the system	52.66%
Percentage of male faculty members' use of the system	49.18%

Table 1.2 The Percentage of Student Use of Blackboard LMS

Students Use of Blackboard LMS	**Number and Percent**

Female Students	22612
Male Students	32556
Female users of the system	12799
Male users of the system	17917
Total students number	55068
Percentage of female students' use of the system	56.60%
Percentage of male students' use of the system	55.20%

Diffusion of Innovation Theory

Diffusion of innovation theory was used to provide insights and guide the study as well as design the research questions because “Rogers’ diffusion of innovations theory is the most appropriate for investigating the adoption of technology in higher education" (Sahin, 2006, p. 1). According to Sahin and Thompson (2006), “In fact, much diffusion research involves technological innovations, so Rogers (2003) usually used the word ‘technology’ and ‘innovation’ as synonyms.” As a researcher in the field of educational technology, I want to investigate the adoption of learning management systems (LMS) within higher education contexts among faculty members at Kansas State University and the relationship of faculty personal characteristics (age, gender, academic ranking and years of teaching experience) with LMS usage and compare that with faculty members at King Saud University in Saudi Arabia.

Diffusion of innovation theory by Rogers (2003) defines diffusion as “the process in which an innovation is communicated thorough certain channels over time among the members of a social system” (p. 5). Rogers provided this description of an innovation: “An innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption”

(Rogers, 2003, p. 12). Therefore, diffusion of innovation is an appropriate theory for understanding the adoption of technology. It explains why some people adopt new ideas and changes more readily than others.

Attributes of Innovation

Rogers mentions that most diffusion researchers focus on people and less on the research regarding innovation. Furthermore, Rogers (2003) extends that “researchers in the past tended to regard all innovations as equivalent units from the viewpoint of their analysis. This oversimplification is dangerously incorrect” (p. 220). The rate of innovation is an important aspect of predicting how people deal with new innovation. Rogers defines rate of innovation as “the relative speed with which innovation is adopted by members of social system” (p. 221). About 49% to 87% of innovation adoption can be predicted according to five perceived attributes: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, (5) observability.

Relative advantage is “the degree to which an innovation is perceived as being better than the idea it supersedes” (Rogers, 2003, p. 229). Cost-effectiveness is an example of a benefit. Individuals can determine which advantage is the most important for them. In addition, the nature of innovation is related to particular advantages. Roger emphasized that “relative advantage is often an important part of message content about an innovation” (p. 233). Many diffusion researchers indicate that relative advantage is one of the useful ways to predict the rate of adopting an innovation.

Compatibility is defined as "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters” (Rogers, 2003, p. 240). Furthermore, the new idea or innovation should meet the needs of the potential adopter to be

considered compatible. A new idea or innovation might not be accepted because of it inconsistent with cultural values of the audiences. For instance, an innovation that is not appropriate for the socio-cultural values and beliefs of the potential adopter is more likely to be rejected. In addition, Rogers indicates "Potential adopters may not recognize that they have a need for an innovation until they become aware of the new idea or its consequences" (p. 246).

According to Rogers (2003), complexity is "the degree to which an innovation is perceived as relatively difficult to understand and use" (p. 257). It is very important that an innovation be clear and less complex in order for it to be adopted and expanded. Innovations are various in their degree of complexity – some of them are difficult, while others are clear. Rogers mentions that the first home computer in the United States was difficult to adopt for individuals who did not have computer skills. As a result, the home computer took a long time to become popular in the United States.

Trialability is defined as "the degree to which an innovation may be experimented with on a limited basis" (Rogers, 2003, p. 258). Some innovations are more likely to be adopted because they allow individuals to try part of the innovation. Personal experience helps users to learn how the innovation works at the same time it is a useful way to give a meaning of an innovation.

Observability, according to Rogers (2003), is defined as "the degree to which the results of an innovation are visible to others" (p. 258). Observability depends on the nature of the innovation; some innovations may not be easy to observe. For example, technology software is observable but in a different way than hardware components, which can be recognized visually. Individuals tend to adopt more innovations that are easily observed (p. 259).

Statement of the Problem

The goal of the study is investigate the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experiences) and their adoption of the learning management system (LMS) at Kansas State University and compares that with faculty members at King Saud University in Saudi Arabia. Using KSU experience with its LMS is a great way to consider the process of adapting e-learning tools in universities. According to Eneh (2010), "If the innovation can be demonstrated as an effective, efficient, and easily applied solution to those focused needs, it is more likely to be adopted and integrated into the programme" (p. 1817)

Many universities in Saudi Arabia are in the early stage of adopting and using e-learning tools such as LMSs. It is important to take into consideration the faculty personal characteristics as factors that might reduce the benefits of eLearning tool. Moreover, organizational support from a university is a fundamental component to meet faculty members needs to ensure effective use of technology in the learning process. Finally, time concern and fear of change of new technology can be barriers to use LMS for some faculty members. This study should help Saudi instructors and university leaders determine the significant factors of successful adoption of a LMS.

Research Questions

The study investigated the relationships between faculty demographics (age, gender, academic ranking, and years of teaching experiences) and their adoption of the learning management system (LMS) at Kansas State University and compares that with faculty members at King Saud University in Saudi Arabia. There are three research questions:

Research Question #1: What is the relationship between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and Rogers's five attributes of innovation (relative advantage, compatibility, complexity, trialability, observability)?

Null Hypotheses:

Ho 1.1. There are no statistically significant differences in faculty response regarding the five attributes of innovation (relative advantage, compatibility, complexity, trialability, observability) by faculty age.

Ho 1.2. There are no statistically significant differences in faculty response of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty gender.

Ho 1.3. There are no statistically significant differences in faculty response of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty academic ranking.

Ho 1.4. There are no statistically significant differences in faculty response regarding the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty years of teaching experience.

Research Question #2: What is the relationship between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and their perception of the organizational support related to the adoption of the learning management system?

Null Hypotheses:

Ho 2.1. There are no statistically significant differences in faculty response regarding the organizational support related to the adoption of an LMS by faculty age.

Ho 2.2. There are no statistically significant differences in faculty response regarding the organizational support related to the adoption of an LMS by faculty gender.

Ho 2.3. There are no statistically significant differences in faculty response regarding the organizational support related to the adoption of an LMS by faculty academic ranking.

Ho 2.4. There are no statistically significant differences in faculty response regarding the organizational support related to the adoption of an LMS by faculty years of teaching experience.

Research Question #3: What is the relationship between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and time concern, fear of change of new technology related to the adoption of the learning management system use?

Null Hypotheses:

Ho 3.1. There are no statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty age.

Ho 3.2. There are no statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty gender.

Ho 3.3. There are no statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty academic ranking.

Ho 3.4. There are no statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty years of teaching experience.

Significance of the Study

Universities are investing a lot of money and time to adopt new technology in the higher education systems in order to create a better learning experience for instructors and students. Moreover, higher institutions provide training programs to make the adoption process easier for users. An LMS is one of the technology innovations that interest many universities around the world because of the advantages of the LMS and the increase in enrolled students that has required education leaders to find a new way to deliver learning materials.

It is crucial to study the faculty personal characteristics because it provides valuable information about attributes and barriers to accepting new technology. On the other hand, it draws education leaders to the crucial elements that should be considered when integrating innovations in the higher education system.

Limitations of the Study

The study was collected by using a cross-sectional survey to provide a general understanding of the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experiences) and their adoption of the learning management system (LMS) among Kansas State University faculty members. The results of the study could not be generalized to all United States Universities because each university has different factors. This limitation was the same for King Saud University as well.

However, the study was helpful to see the impact of related factors that all universities share. Moreover, the researcher had experience with Canvas learning management system at Kansas State University that gave better understanding of the advantages and disadvantages of this particular LMS.

Definitions

Adoption: "The decision to make full use of an innovation as the best course of action available" (Rogers, 2003, p. 21).

Blended Learning: It represents an opportunity to integrate the innovative and technological advances offered by online learning with the interaction and participation offered in the best traditional learning. (Thorne, 2003, p.5).

Innovation: "An innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12).

Learning Management System: "Internet-based learning management systems (LMSs) such as Blackboard, Moodle, WebCT, Canvas, Scholar, and Desire2Learn are some of the popular internet technologies that support distance, face-to-face, and hybrid/blended teaching-learning processes" (Sanga, 2016, p. 11).

Educational Technology: "Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources" (Januszewski & Molenda, 2013, p.1).

Relative advantage: "the degree to which an innovation is perceived as being better than the idea it supersedes" (Rogers, 2003, p. 229).

Compatibility: "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (Rogers, 2003, p. 240).

Complexity: "the degree to which an innovation is perceived as relatively difficult to understand and use" (Rogers, 2003, p. 257).

Trialability: "the degree to which an innovation may be experimented with on a limited basis" (Rogers, 2003, p. 258).

Observability: “the degree to which the results of an innovation are visible to others” (Rogers, 2003, p. 258).

Canvas: The learning management system that faculty and students use at Kansas State University.

Blackboard: The learning management system that faculty and students use at King Saud University.

Chapter 2 - Literature Review

This literature review is organized into six sections. Section one describes the Learning Management System (LMS) with different learning approaches. Section two reviews the negative factors affecting the integration of LMS. Section three reviews the positive factors of LMS adoption. Section four explain personal characteristics of faculty members (age, gender, years of teaching experiences). Section five reviews the effect of organizational support in adopting new technology. Section six reviews the theoretical framework Rogers' Diffusion of Innovation (DOI) Theory.

The Use of Learning Management Systems in Higher Education

Three types of learning approaches in higher education use learning management systems (LMS). These learning situations are where teachers and students share information in order to make the teaching and learning process more effective. Providing a general idea of each learning setting is helpful to understand the role of LMS in each approach. According to Allen and Seaman, (2010), the first setting is online learning. In this setting, the courses are online, and the learning materials delivery is all handled through the LMS as there is no face -to-face meeting in the classroom. The second option is the blended or hybrid classes. In this setting, students and teachers can use the LMS features for communication such as online discussions and submitting their assignments, and they meet face-to-face. The third learning environment is a traditional face-to-face course where instructors use the LMS as web-facilitated (Allen & Seaman, 2010). Woods, Baker, and Hopper (2004) investigated the faculty members' use of Blackboard LMSs to supplement face-to-face education. The participants in the study included 862 faculty members from 38 universities in the United States. The major use of the LMS was for course documents

and instructional delivery. For example, instructors commonly published their syllabi, and 81% of the faculty members used the LMS to send emails to their classes or individual student.

Online Learning

Many studies try to define online learning or distance education. According to Moore and Kearsley (2005), "Distance education is planned learning that normally occurs in a different place from teaching, requiring special course design and instruction techniques, communication through various technologies, and special organization and adytrative arrangements" (p. 2). Distance learning opens new ways for the people who are interested in continuing their educational journey but cannot attend regular classes. The effective use of an e-learning approach may be related to the availability of the LMS, which is also known as Virtual Learning Environments (VLE) or learning platforms. A LMS help faculty members to deliver their learning materials to the learners. The system allows users to track participation and progress through data systems and assessments. It also facilitates the instructional process and distribution of learning materials in distance education environments (Paulsen, 2003).

LMS and Blended Learning

In the last few years, the blended learning approach has become popular in higher education settings. According to Wu, Tennyson, and Hsia (2010), "Recently there has been an increasing movement toward blending e-learning and face-to-face activities with students participating in collaborative learning and interaction with their instructors and classmates" (p. 156). Blended learning has the advantage of combining the best of face-to-face with the best of online learning. LMS as the online learning platform can be used to meet learners' needs such as flexibility of time and location to access learning materials. According to Makarem (2015), "Many researchers have recommended using a combination of online and face-to-face education

to cater to different student needs and benefit from the advantages of both formats" (p. 156). However, it is crucial to understand that using online tools in face-to-face classes does not mean switching the entire course to online. Blended courses provide an opportunity for faculty members to discover the advantages of two learning environments that can work together to produce better teaching and learning experiences for teachers and students. Welker and Berardino (2005) focused on blended learning and understanding the middle ground between the traditional classroom and fully online instruction. They defined blended learning as "any combined use of electronic learning tools that supplement but do not replace face-to-face learning" (p. 33).

Adopting the LMS platform is important for academic institutions that wish to include blended learning as a teaching method. Blended learning can be a solution for those faculty who would like to explore an online learning environment. Having interaction between instructor and students through the LMS as well as in the face-to-face setting helps faculty to feel safer than moving directly to online learning because faculty do not have the chance to meet students or vice versa (Black et al., 2007).

Daniels (2009) showed that using an LMS for educational purposes has many advantages such as increasing independent learning. The teacher's role becomes that of a facilitator that puts learners in the center of the learning. The LMS can be a way accomplish the advantages of a traditional learning approach with independent learning outside the classroom. Additionally, LMS makes the learning process ongoing and does not require place or time for learning to occur.

Face-to-Face Learning

Traditional face-to-face courses were defined by Potter (2015) as "characterized by student and faculty interaction via lectures, discussion and exams on campus at scheduled times of day" (p. 3). There are certainly advantages to face-to-face learning. For example, faculty members in this traditional setting are required to have office hours that allow for face-to-face meetings with students. This can be a useful feature in a small college but it will be difficult to have office meetings in the large university because of the larger student enrollment, but even with the difficulties of handling a large number of students, adopting new technology in the face-to-face environment has merit. Black et al. (2007) suggested that universities should adopt LMS gradually into the higher education system. When faculty start by using LMS in a face-to-face environment, it gives the instructor confidence and a secure feeling toward using the system instead of beginning by trying the LMS in a complete online setting.

Negative Factors Affecting the Integration of LMS

Many studies investigated faculty members' experience using learning management systems and e-learning technologies. It is important to be aware of the challenges that limit the expansion of new learning innovations. A study by Brill and Galloway (2007) focused on college-level instructors' use of and attitudes towards classroom-based teaching technologies and barriers for technology use in the classroom. The study found two major factors influence faculty to use technology. The first factor was the classroom environment including lights, sets, and other materials, and the second factor was the limited access to equipment. These two barriers related to many eLearning tools. For example, poor internet access would prevent users from utilizing LMS. Hew, Khe and Brush (2007) focused on barriers of integrating technology into a K-12 setting. After reviewing many studies from 1995 to 2006, they found most barriers of

technology integration fell under six major themes: (1) resources, (2) knowledge and skills, (3) institution, (4) attitudes and beliefs, (5) assessment, and (6) subject culture. Resources as barriers can include different meanings such as lack of equipment, time, or technical support. Chizmar and Williams (2001) conducted a study at Illinois State University to investigate the barriers of adopting technology in teaching and learning. Problems facing faculty members when integrating technology included the gap between using technology and the pedagogical goals. Technical support was one of the demands that faculty wanted while using new learning tools. The most important issue to consider was that faculty members did not have time to learn how to use new technologies. After reviewing many studies that focused on the barriers to adopting LMS as innovation technology, this researcher decided to focus on two factors: (1) time concern and (2) fear of change toward technology. These two factors can have a major impact on the adoption decision of the LMS among faculty members.

Time Concern

Lack of time is one of the biggest barriers for adopting technology among faculty members. A study by West et al. (2007) mentioned that faculty members face challenges when integrating Blackboard to their teaching methods. One of the most important challenges is the cost of time and energy as users invest time and effort to adopt new learning tools. Support and feedback from peers and technical support team are fundamental to engage users to utilize the new learning system. Teaching Assistants (TAs) can be a resource to help faculty members adopt the LMS and organize learning materials. As a researcher in the adoption process of LMS among faculty members at Kansas State University, it is important for me to be aware that a lack of time might inhibit instructors from adopting new technologies such as LMS.

Three types of users, which are faculty, students and staff, use LMS at universities. The impact of time among faculty members was greater when compared to students and staff. Walker (2014) investigated the attributes and barriers that influence the adoption and diffusion of a LMS at Texas A&M University. Three types of LMS platforms were covered: Blackboard Learn, Moodle, and Sakai. The data were obtained from 210 faculty members, 123 staff members, and 350 students using a cross-sectional survey. The study focused on six barriers of adoption LMS: (1) cost concerns, (2) fear of change, (3) migration process, (4) system support concerns, (5) system complexity and usability, and (6) time concerns. The findings indicated a significant difference in the time concern: $F(3, 498) = 3.77$, $p < .05$. The study emphasized that "Time is valuable and can be a barrier to adoption. Users do not want to spend hours, days, or weeks to learn how to reuse a new LMS" (Walker, 2014, p. 47). The study found that faculty members have a higher time concern than students and staff about using LMS, and that can be a barrier to utilize LMS or may limit the users' experience of this system. For instance, faculty may use few features instead of exploring more useful features.

The concern about time was one of three challenges that Wachira and Keengwe (2011) found in their study. They focused on barriers to integrating technology in mathematics classrooms. The study findings indicated that teachers faced several challenges such as lack of hardware and software. Another demand was the need for technical support to solve technical issues. Lack of time is another barrier that teachers faced when integrating technology. Instructors need enough time to learn how to use technology and to explore the innovation. yet teachers believe they are too busy to do anything extra. Additionally, teachers faced lack of knowledge to use technology in the classroom because they needed pedagogical knowledge to use technology appropriately to meet the learning objectives (Wachira & Keengwe, 2011). For

this reason, it is essential to make connections between technology such as LMS and the courses. For example, if the course requires massive reading and discussion, LMS features allow faculty to upload reading materials and open a discussion online.

To understand the impact of time on adopting decision toward online learning and new technology, Cavanaugh (2005) found that faculty members are afraid to try online learning because of the workload and time requirement in online courses. Comparing traditional face-to-face courses to online courses the study found that online sections take twice the amount of time for grading online discussion and finishing class activities. Similarly, a study by Lazarus (2003) focused on the time needed to teach online courses. The largest amount of time commitment faculty members spend was for grading online discussion. Other factors that affected the amount of time for each class included class subject, course level, and students' level (undergraduate or graduate).

Sahin (2005) conducted a qualitative case study in an attempt to understand faculty adoption of technology. Sahin interviewed Mary, who mentioned that "Time is always a need for everybody. Probably time and in that opportunity is to think about the way technology can be used most effectively to expand the curriculum and not just do what we're already doing" (p.82). Similarly, Karagiorgi (2005) indicated that trying innovations requires time; teachers are reluctant to spend their time needed for classes on exploring new technology.

Al-Senaidi, Lin, and Poirot (2009) focused on the barriers to adopting information and communication technologies (ICT) in Omani higher education. The participants of the study were 100 faculty members from different departments in the College of Applied Sciences in Oman. Five factors were considered to be barriers: the lack of equipment, poor institutional support, negative belief about benefit of technology, lack of confidence, and lack of time. The

researchers found lack of time and lack of technical support from the institution were the most important barriers facing faculty members. Other studies two studies in Saudi Arabia found no relationship between time and technology use. Moukali (2012) conducted a study on the factors that influence faculty attitudes toward adoption of technology. The study participants were 303 faculty members at Jazan University, Saudi Arabia. The study found that workload related to adopting technology did not influence the adoption of technology such as an LMS. However, the study found that a lack of training was the main factor that negatively affected faculty adoption of technology. Alhawiti (2011) investigated faculty perceptions of attributes and barriers impacting diffusion of online education at two Saudi universities. The study found no a statistically significant difference between time concern and technology adoption.

This current research intends to draw the attention of education leaders to the factors that might prevent faculty members from using technology such as LMS. This research is concerned with how ignoring the impact of time could lead to unsuccessful adoptions of technology.

Fear of Change and Technology

Change in education settings and delivering learning materials through the use of new technology, such as LMS, can be difficult for faculty. There are two perspectives on the impact of users fear and concern related to technology use. A study by Al-Sarrani (2010) found that there was no statistical significance between faculty teaching experience and using blended learning, which required an LMS system to deliver information and knowledge. On the other hand, Ferdousi (2009) investigated the factors that affect instructors' intention to use an e-learning system in two-year colleges. A survey was collected from 124 faculty members in different academic departments at Spartanburg Community College in South Carolina. The study focused on four effects: (1) resistance to change, (2) perceived value of e-learning systems, (3)

computer self-efficacy, and (4) attitude toward e-learning systems on intention to use e-learning systems. The findings showed that all four independent variables have a significant impact on intention to use e-learning systems, but the greatest impact was resistance to change. Resistance to change had strongest effect (Estimate = 1.461, $p < .001$) on IU after that attitude toward e-learning systems had (Estimate = 1.395, $p < .001$), perceived value (Estimate = 1.376, $p < .01$), and computer self-efficacy (Estimate = 1.247, $p < .01$).

Resistance to change plays an important role in accepting or rejecting new technology. According to Giangreco (2002), "Resistance to change is a form of organizational dissent to a change process (or practices) that the individual considers unpleasant or disagreeable or inconvenient on the basis of personal and/or group evaluations" (p. 14). Certainly, there are reasons that push individuals to resist change. Hultman (2003) suggested eight causes that make people resist change:

1. It starts when individuals believe that a changing process is handled improperly. It is important at this time to provide people with information about the benefit of the change. For example, the university can provide faculty members with information and training to discover the advantages of the LMS.
2. Some people believe there is no need for change. This happens when individuals do not see the benefit or reasons to change because they are not in charge of the organization and they are not aware of the consequences.
3. When individuals believe that change will make their work harder, it is important for leaders to make the adoption process clear so that the individuals to support the new change. For instance, faculty members need to understand that using LMS will not negatively affect their teaching method.

4. Individuals believe the risks are more than benefits of the change. For this reason, it is fundamental to understand two types of thinking toward changing, which are the optimistic and the pessimistic.
5. Individuals may resist change because of the lack of ability to change. Starting new experiences can be a challenge for some people because they are not able to change.
6. Individuals believe the change will not succeed. It is crucial for the target individuals to have confidence about the change in order to adopt with new situation. For instance, faculty members need to have confidence to use new technology to achieve a better experience.
7. The change is not consistent with their values. Considering individuals' values and beliefs is a key to gain support and to make the change process successful.
8. Resisting change can occur because individuals do not trust the people who make the change (Hultman, 2003).

A study by Berge (1998) found two barriers of technology adoption: the fear of technology and resistance to change. Among the 42 faculty members who were surveyed in the study, 31.9% mentioned the inability to adapt to organizational changes such as online teaching norms and expectations. These were considered to be barriers to motivating faculty to use new teaching methods. Being aware that the fear of change as a barrier to adopting an LMS is the first step to finding a solution for this issue. If university leaders keep adding more technology without considering the barriers which cause a loss of the previous tools, it is possible the university leaders will lose time, energy, and money. Walker (2014) studied the attributes and barriers that influence the adoption of a learning management system at Texas A&M University.

The study found a significant impact of fear of change and technology as a negative barrier that influenced faculty member adoption decisions. Sinclair and Aho (2018) found that fear of new technology was one of the most important barriers that faculty members faced while using an LMS. This fear can take on different forms such as a fear that technology may replace the face-to-face traditional classroom.

Furthermore, academic rank and teaching experience of the faculty members could play an important role in the adoption process. More than one study found that prior knowledge was beneficial in encouraging participants to explore the new LMS, while other studies found that the opposite (Hackbarth, Grover, and Yi, 2003; Kamal, 2013; Lloyd, Byrne, and McCoy, 2012).

Hackbarth, Grover, and Yi (2003) mentioned that experiences and knowledge can help users to decrease their anxiety level toward technology. In other words, faculty members with more technological experience may have little fear toward technology and willingly/easily explore new tools. Similarly, Kamal (2013) found that faculty members who used an LMS for more than three semesters were able to use more advanced system features than those who hadn't used the LMS for as long. Conversely, Lloyd, Byrne, and McCoy (2012) found that faculty members with less online teaching experience faced more interpersonal challenges than instructors who had more online teaching experience. This additional experience allowed them to be more comfortable with their LMS.

Positive Factors of Adopting LMS

A way to understand the positive impact of using LMS for educational purposes is to see other studies that have been done in the past. Osika, Johnson, and Buteau (2009) attempted to understand the factors that affect faculty members' adoption decisions regarding a course management system in a Midwest university. The study used a survey design to gather

information. They sent out 75 surveys and heard back for 36. Most of the respondents indicate three important factors influence their adoption decision. The first factor was successful experience with other technology. The second factor was a faculty desire for flexibility. The third factor is the perception of the need for online courses. Similarly, Woods, Baker, and Hopper (2004) found that 82% of the faculty members in study that include 862 faculty members from 38 universities in the United States agreed that LMS helped them to deliver information to their students and to make the course requirement clearer. Another reason to use the LMS is that students are expecting faculty members to use a new system to deliver information that is compatible with the technology age. Additionally, more than 60% of the faculty members in the study found that the LMS helped them meet students' educational needs, manage their time, and enhance their students' ability to learning (Woods, Baker, & Hopper, 2004). Similarly, Yidana et al. (2013) conducted a study at Ghana's' University of Education regarding adopting with Moodle learning management system. The university goal was to increase teaching and learning quality. The Moodle LMS system was used to support face-to-face classroom and to create blended learning modes. The study found that using LMS helped students with assessment online, quizzes, and access to high quality learning materials. Overall, the students showed a positive attitude toward using LMS as a learning system. The only concern that students had was the lack of internet access outside university campus. Another study by Zhao, Pugh, Sheldon, & Byers (2002) found that successful integration of technologies in the classroom should consider three main elements: innovators, innovation, and the context. Innovators refer to teachers or faculty members, and three factors are related to innovators: technological proficiency, pedagogical compatibility, and social awareness. To ensure effective use of technologies in the classroom, instructors need to acquire the knowledge and ability to use technology. They need to

know what is important to use about the new innovation. Moreover, the adoption of innovation increases when instructors find the connection between technology and curriculum. Social awareness helps faculty members find the right individuals who can provide help and support through adoption process of an innovation (Zhao et al., 2002).

Innovation refers to the nature of technology itself. Some innovation might not be accepted for two reasons, which are distance from the school or university cultural practice and the availability of resources. The second reason is reliance on other people who are not at that university and do not provide enough support and training (Zhao et al. 2002).

Context is where the innovation takes place. To determine the success or failure of technology there are three aspects. First of all, the context for the human infrastructure includes the technical support team in the organization. Next, the technology infrastructure includes the computer lab and other related equipment. Finally, the social support system includes peer support and administrators (Zhao et al., 2002).

Using new learning tools require time and energy from the faculty members who might be busy with other work. West, Waddoups, and Graham (2007) found that Teaching Assistants (TA) were an effective resource to help faculty members adopt an LMS and organize learning materials online. The study also mentioned that attending training sessions is helpful for preparing faculty members to use LMS, but the impact of colleagues in the same department was higher.

Social Media vs LMS

Using social media platforms for teaching and learning has become popular among educators. Kaplan and Haenlein (2010) define social media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and that

allow the creation and exchange of user-generated content" (p. 61). Another way to think about social media is personal platforms that allow individuals to share their life. Recently, using the internet has become synonymous with using social media for many people (Manca & Ranieri, 2016).

A study by Wang, et.al (2012) focused on using a Facebook group as a learning platform. Some benefits were creating announcements for the class, sharing course content, and establishing online discussions. On the other hand, one of the vital considerations while using these platforms is privacy and safety. The study emphasized that a Facebook group is considered an unsafe learning environment. For example, students were worried that their friends would have access to their academic work (Wang et.al, 2012). Additionally, users needed to have control of the platforms because, if they did not feel comfortable and secure, they would not continue to use the social network or they might use it for limited information (Karahasanovic et al., 2009).

Several studies focused on the use of social media for faculty members. Manca & Ranieri, 2016 and Veletsianos and Kimmons, 2013 found that scholars were interested in using social media to engage with colleagues and keep up with new research in their fields. What is more, academics have been using their sites to become public intellectuals. On the other hand, scholars are not as interested in using social media for teaching purposes.

A learning management system is the official way to deliver learning materials with more confidence and security for teachers and students. Several reasons, such as cost, access, and quality, encourage most universities in the United States to adopt an LMS. An LMS allows instructors to have control over their courses in the online learning environment (Coates, James &Baldwin, 2005).

Mobile learning

A Learning management system is compatible with mobile learning teaching styles. This approach focuses on allowing students to use their devices such as smartphones, computers, and tablets for learning purposes (Kukulska-Hulme & Traxler, 2005). Moreover, mobile learning has many features that engage users such as being easy to care for and providing individual learning opportunities for students. Additionally, mobile learning allows users to access information and knowledge from their devices, which makes the learning process more accessible (Hyungsung Park, 2005).

A study by Hollabaugh (2016) focused on students' perception of ease of use and of the usefulness of mobile devices in a university classroom setting. The percentage of students who uses Blackboard mobile learning to access course information and to complete course assignments was 131 out of 150, or 87% of the participants in the study. Nowadays, students want to use tools that are related to their age and interests, such as smartphones and tablets. It would be useful for educators to think about teaching approaches that meet their learners' needs. According to Han and Shin (2016), "Mobile LMSs specifically provide students with unique opportunities to view lectures, participate in discussion, interact, and share ideas with others anywhere and anytime" (P. 81). These features of cell phone allow users to keep up with educational responsibilities. Similarly, Hollabaugh (2016) emphasizes that mobile software applications for learning management software such as Blackboard (LMS) for mobile allows students to interact with their course materials from their smartphones.

Personal Characteristics of Faculty Members

Many studies tried to investigate the adopting with new innovations and users' demographic variables such as age, gender and years of teaching experiences. Two trends were

founded related to innovation adopters, Hall, George& Rutherford (1979) found that demographic variables had no positive connection with concern-based technology adoption. On the other hand, other studies found that demographic variables play in important role in adapting technology related to computer use (Adams,2002; Al Meajel and Sharadgah, 2018; Eldridge, 2014; Hwu, 2011; Omar, 2016; Petherbridge,2007; Shea, 2007)

Age

Many studies have found no relationship between faculty members age and technology adoption. North Carolina State University (2004) conducted a study faculty experiences with computer-based instructional and learning aids with 1790 participants and 55% respond rate. No statistical significance was founded between faculty members age and technology use in the courses. Similarly, two Concerns-Based Adoption Model studies found the same result (Hwu,2011; Kamal, 2013).

On the other hand, age was found to be a significant variable in three studies (Adams, 2002; Petherbridge, 2007; Ruth, 1996). Adams (2002) study focused on the teachers' concern related to integrating technology with 589 participants and 39% respond rate. Found that teachers under 34 years old have higher level of computer integration. Similarly, Ruth, 1996 studied the faculty acceptance and resistance of internet technologies at Moorhead state university with 216 faculty members. The researcher found that faculty member age 45 and younger were more likely to use internet and faculty member with age 46 and older are less interested to use internet technologies. Also, Petherbridge (2007) studied the concerns in the adoption of LMSs in a higher educational setting with 1196 participants and 29% respond rate. The study found age as predictive of the faculty members use of LMS. The older faculty had less interest knowing about LMS or use the system as well. Similarly, Shea (2007) study the bridges and barriers to teaching

online college courses. Participants were 386 faculty teaching online in 36 colleges in a large state university in the United States. The researcher found that faculty members can be divided as two groups regarding to their age. Faculty with 45 years and more are motivated to use online teaching because they see it as new learning approach. Younger faculty instructors are interested to use new learning styles because they believe it help them to achieve tenure or promotion.

Gender

Gender is one of the demographic factors that had been studied by several scholars in the field of education. Previous studies did not show differences among faculty members gender and technology use (Gerlich and Wilson, 2004; Petherbridge, 2007). A study by Gerlich and Wilson (2004) at West Texas A&M University focused on the faculty perceptions of distances learning with 110 participants and 48% respond rate. 39 of the faculty members were teaching online courses and 71 were not. The study found no differences between male and female only those who teach online classes were different from others. This finding is similar to Petherbridge's (2007) study which found that gender had no statistically significant relationship with respect to concerns of adopting an LMS in teaching.

Shea (2007) found that females were motivated to teach online classes because women have more domestic responsibilities than men. In addition, the study found that online teaching provided opportunities to manage their academic jobs and their family needs. Similarly, another study from Saudi Arabia by Almuqayteeb (2009) support the idea of female use of technology in education. Almuqayteeb study found that female faculty were integrating technologies in their teaching approach. In addition, the study found the female faculty show positive attitudes toward using technology tools. Overall, female instructors have more reasons to try technology than males.

Years of Teaching Experiences

Teaching experiences is one of the aspects that might play an important role of adopting with new technology among faculty member. Lamboy and Bucker's (2003), which studied the relationship between how long faculty member had been teaching and their technology use. The researchers found that older faculty tended to use fewer technology tools in their teaching, and younger faculty showed higher levels of usage. Likewise, Alaugab (2007) focused on the barriers of Saudi female faculty members using online learning tools. The study found a relationship between the teaching experiences of the faculty member and online learning. Faculty who had more years of teaching experience showed less attitude towards online teaching. This means that when the faculty member gains more experience, she is less interested in trying new teaching tools and instead prefers to use traditional teaching approaches.

On the other hand, a study by Eldridge (2014) focuses on the faculty adoption and utilization of blackboard at a community college in the Kentucky, United States. The participants were 358 faculty members with 38% respond rate. Rogers's Diffusion of Innovation theory was used in the study. The researcher found that users with less teaching experiences were the lowest users of Blackboard system. Similarly, Al Meajel and Sharadgah (2018) conducted a study a King Saud University, Sadia Arabia. The investigated the barriers that face faculty members to use Blackboard. The study found that users with 15 years and less of teaching experiences faced more difficulty with LMS. The study attribute that for the workload for the younger faculty members that might prevent them to use new technology in teaching. In addition, the study emphasis that faculty with more teaching experiences are be able to manage difficulties with new technology because of their experiences.

Another studies found no statistically significant differences between faculty members' years of teaching experiences and technology use. Al-Sarrani, (2010) investigated the adoption of blended learning approach by science faculty in three departments Biology, Chemistry and Physics at Taibah University, Saudi Arabia participants were 148, and 58% response rate. The researcher found no relationship between faculty members' years of teaching experiences and the adoption with technology. Similarly, Kamal, (2013) conducted on the concerns of the faculty regarding the adoption of online teaching in six departments in the College of Arts and Humanities at King Abdulaziz University, Saudi Arabia with 147 participants and 63% response rate. The study found no statistically significant differences between faculty members' years of teaching experiences and online teaching.

Academic Rank

Academic rank of faculty members at a university might have a great impact on the diffusion of technology. There are many studies in the education field that investigated the relationship between academic rank and technology acceptance. A study by Mwenda (2010) focuses on faculty concerns and perceptions that influence the adoption of a course management system with 161 faculty member and 45% response rate. Among different characteristics of faculty, a significant difference on the academic rank. Petherbridge (2007) found that academic rank is factor that should be consider in the integration of LMS. The researcher found that "Tenure status and rank were also predictive of faculty concerns. Respondents who are tenured or with the rank of instructor had lower self-personal concerns than other faculty, implying tenured faculty, or those hired with a teaching focus, are not as worried about the rewards structure for using technology." (p.269). Likewise, Alnujaidi (2008) investigated the faculty member adoption of Wieb-Besed Instrion in Saudi Arabia. A statistical significance was founded

between the academic rank and the adoption of innovation. The study found that 151 of the adopters of WBI were Lectures and teacher assistances and 66 were faculty with Ph.D. degree.

Conversely, Al-Sarrani (2010) conducted a study on the university faculty adoption of blended learning in Saudi Arabia. He found no relationships between faculty academic rank and their adoption of blended learning approach. This funding is similar to the (Kamal;2013 Omar;2016) that faculty academic rank had no impact on the faculty member adoption of technology.

Organizational Support

Organizational support refers to the university support in different aspects of adopting technology in the education including training development programs, funds, and availability of technology tools for learning purposes, as well as providing a technical support team to ensure a successful technology integration process (Kelly, 2005). To understand the effect of organizational support in adopting new technology among faculty members at a university, Rogers (2003) mentioned that the diffusion process occurs in a social system that includes individuals and the organizations or institutions. A social system impacts diffusion of innovation by the norms. According to Rogers, (2003) “Norms are the established behavior patterns for the members of a social system” (p. 26). As result, individuals are following the rules inside an institution. Ambiguous or inflexible rules might slow or affect the adoption process. For instance, if the rules are not clear on how to use online materials in the LMS, the faculty members may feel uncomfortable using the system.

An opinion leader is another item that affects diffusion of innovation. Rogers mentioned that leadership has the ability to drive other individuals and change their behavior to act and work in a certain way that meets the leader’s desire. For example, faculty members can be a

resource used to spread the use of new technology such as LMS in the university, and thus make it acceptable to others. Finally, the change agents inside the organization can be a person who has a position in a university that allows him or her to select a new idea or innovation such as LMS. They can positively impact the adoption decision if they have a desire toward the new ideas. In contrast, they can slow or prevent undesirable innovations among other (Rogers,2003).

A study by Fulk (1993) focused on social construction and the adoption of technology. The study found that the organizational environment including peers support and working as a group are significant factors in adopting or rejecting new technology. Another study by Rahman (2001) indicates that university missions can be a reason to accept or reject new technology among faculty members. For example, faculty members who adopt online learning have the desire to meet the university mission toward using online teaching.

Bates (2000) described the faculty members as a fundamental component in the university and colleges, especially in teaching and learning changes. A university must support them in the change process, which can include a new plan to integrate technology and also possibly a new teaching style, so that progress is made. Bates stated, “When it comes to organizational structures, the challenge is to develop a system that encourages teaching units to be innovative and able to respond quickly to changes in subjects matter, students’ needs, and technology. At the same time, redundancy and conflicting standards and policies across the institution must be avoided” (p.181).

University campuses should be ready for integrating technology in order to make the adoption process more accessible. Butler and Sellboms (2002) found that reliability on technology was one of the problems faculty faces while using technology in their teaching process. Other issues include poor internet access and software that was unreliable. Additionally,

providing support and improvement for faculty members is essential to meet the university expectations. For example, if a university has a goal to be one of the top 100 universities in the world, it should invest in development in human and learning resources as well. Brown, Benson, and Uhde (2004) indicated that "One of the missing components is support for faculty through the use of ongoing suitable professional development opportunities" (p.101). Bennett and Bennett (2003) investigated the factors influences faculty members adoption of a course management system. The researchers found that training on CMS was important to step to improve the adoption of CMS among faculty members.

These studies indicate that institutional support plays an important role in adopting innovation among faculty members. LMS is one of the innovations that universities offer to deliver learning materials and make communication channel between faculty and students.

Organizational Support and Learning Management System

Previous studies investigating the relationship between a faculty member's age and the provision of organizational support and the success in persuading the individual to adopt new technology support this. Lane and Lyle (2011) conducted a study on obstacles and supports related to the use of educational technologies. Five hundred forty-seven faculty participated in the study at the University of Washington. Researchers found that older faculty have less experience using technology. In this case, direct administrative support was more helpful to older faculty than younger faculty. On the contrary, younger faculty members were more interested in using online support. Similarly, a study by Adams (2002) found that younger faculty (between the ages of 18-34) also had a higher level of technology integration. Owusu-Ansah (2001) investigated faculty concern regarding the use of technology. The study also found that older faculty members were not only less interested in using technology, but also not interested in

learning new information about integrating technology Kagima and Hausafus (2000). They found that faculty who were 60 years or older were less confident in utilizing electronic communication in their courses.

On the other hand, Pereira and Wahi (2017) conducted a study on course management systems and willingness to complete training on 102 faculty members and rate 26% at Fitchburg State University, in the United States. The study emphasized that faculty training on course management system is an essential element in the adoption process and use of CMS. Unlike other studies, the researchers found that older faculty were willing to complete training sessions about the functions and use of CMS.

Gender

Gender and administrative support has been investigated in previous studies. Lane and Lyle (2011) conducted a study on obstacles and supports related to the use of educational technologies. Five hundred forty-seven faculty participated in this study at the University of Washington. The researchers found that female faculty found administrative support and workshops to be more helpful to them than males. Similarly, Pereira and Wahi (2017) found that female faculty members were more willing to complete online and face-to-face training on how to use CMS than males.

Other studies have mentioned that female faculty members faced difficulties when integrating technology. A study by Schifter (2002) found that females experience more difficulty than males when integrating technology into their teaching. The research indicated that a lack of background and technical support were important reasons to improve female technology integration. Similarly, Almuqayteeb (2009) conducted a study on attitudes of female faculty toward the use of computer technologies and the barriers that limit their use of technologies. The study included 197 female faculty members in Saudi Arabia. The study found that female faculty

members need support in different areas such as technical support, access to technological equipment, and learning important information about technology tools. Likewise, Spotts, Bowman and Mertz (1997) conducted a study on the impact of gender and the use of instructional technologies on faculty members at Western Michigan University in the United States. The study included 367 participants and a response rate of 48%. The study found that male faculty members tended to show better information and knowledge about technology innovation than female. Lack of professional development was one of the important reasons that affected female faculty members' use of technology.

Conversely, a previous study that investigated the impact of gender in the integration of technology among faculty members. McKinley et al. (2014) found no a statistically significant difference between gender and attitude toward integrating technology. At the same time, professional development programs were integral to the adoption of technology in higher education settings.

Years of Teaching Experience

According to Adams (2002), faculty with 0 to 3 years of teaching experience had the highest level of concerns and a significantly higher level of technology integration than those with 10 to 19 years of teaching experience. In contrast, Petherbridge (2007) found that respondents were concerned about three types of support related to LMS adoption. The first one was the technical support while using the system. The second concern was training related to the LMS. The third concern was the faculty needs of knowledge that would encourage them to use an LMS for their students.

Other studies found no difference between faculty members' years of teaching experience and organizational support related to LMS use. A study by Kamal (2013) focused on the

professional development needs of faculty at King Abdulaziz University in Saudi Arabia when adopting online teaching. The study found no a statistically significant difference when comparing faculty concern in adopting online teaching and the faculty years of teaching experience, but Kamal mentioned interesting findings related to administrative support and professional development. The study emphasized that administrative support plays an integral role in the adoption of technology. Only 50% percent of the participants believed that the administrator in the department supported faculty members' use of technology.

In terms of professional development, 74% of the participants agreed that they needed immediate training related to technology. In addition, 93% of the participants needed better access to the Internet, and 75% participants needed technical support in terms of technology integration. Similarly, a study by Omar (2016) focused on the professional development needs of faculty at King Saud University in Saudi Arabia with regard to adopting online teaching. The study found only 177 out of 296 faculty used an LMS for at least one semester. Even though the study found no a statistically significant difference between faculty concern in adopting online teaching and the number of years of faculty teaching experience, the study drew an important finding related to administrative support: only 55% percent of the participants, almost all of whom had fewer than 20 years of teaching experience, believed that the administrator in the department supported the faculty members' use of technology. Moreover, 80% of the participants agreed that they needed immediate training related to technology, while 87% indicated that they needed technical support related to technology integration.

Academic rank

previous studies focused on the difference between users according to their academic rank and their response to organizational support related to the LMS. A study by Al-Shboul

(2013) investigated the level of learning management systems integration at the University of Jordan. The study emphasized that faculty members with higher academic ranks were less likely to use eLearning tools. The study found different factors inhabit faculty members' (including assistant professors', associate professors' and professors') use of the Blackboard LMS. These factors are related to organizational supports such as training, development, workload, negative feedback from peers about the LMS, and technological background. Similarly, Petherbridge (2007) found that academic rank was predictive of faculty concerns related to LMS adoption. This study found that "respondents who are tenured or with the rank of instructor had lower self-personal concerns than other faculty, implying tenured faculty, or those hired with a teaching focus, are not as worried about the rewards structure for using technology" (Petherbridge, 2007, p. 269).

Gordon, Gratz, Kung, Mooreand and Urbizagastegui (2018) focused on the faculty perceptions of the LMS at University of La Verne in California. The participants in the study were full time faculty members who were mostly over fifty years old. The participants believed that organizational support, including clear policies, support for teaching online, and training for faculty members and students, were fundamental aspects to integrate technology (Gordon et al., 2018).

Gautreau (2011) conducted a study on the motivational factors that influence faculty members' adoption decisions of an LMS at the University of Southern California. The study found a significant relationship between the academic ranks and whether a faculty member adopted technology in his or her course. Untenured faculty were more interested in using available resources such as technology tools to improve their teaching and help improve students' experiences.

Theoretical Framework

Rogers' Diffusion of Innovation (DOI) Theory, developed in 1962, is an appropriate and useful theoretical framework for understanding how and why an innovation is adopted within or among a community. Accordingly, diffusion of innovation theory will provide insights into and guide this study on the adoption of new technology in higher education, specifically, the Canvas LMS at Kansas State University (KSU). Having a clear picture of how this technology was successfully adopted in this context may provide guidance for other higher educational institutions in their process of adopting an LMS. The researcher is specifically interested in the potential of King Saud University, Saudi Arabia, adopting a new LMS and hopes this study on KSU's experience may prove instructive as they consider how best to approach this process.

In their study on technology acceptance among faculty members in higher education, Gibson, Harris, and Colaric (2008) draw attention to the difficulty of the transformation from traditional teaching and learning methods–such as face-to-face lectures–to a new way of communicating and delivering knowledge for learning purposes–such as an LMS. The authors conclude that adoption of new technology in an organization is not an easy task and will often face resistance. Having a framework that allows for an understanding of what makes an innovation more likely to be adopted can help.

Another study by Intharaksa (2009) attempts to explain the faculty use of Web-based instruction and why faculty members decide to incorporate Web-based instruction at a university in Thailand. The study used Rogers's DOI Theory and focused on the five attributes of innovation. Seven instructors agreed to participate in the study. They found using CMS platforms helped students to become independent learners. Additionally, it helps to create a learning approach that promotes learner- centered. The study emphasized that the role of the

teachers has changed recently and learners today need to access more learning materials such as reading texts. Another reason to use CMS was that students have been born in the computer age. They expect faculty to use CMS for the instructional process. For example, students compare between instructors who use eLearning tools and who do not. One faculty member mentioned it is hard to refuse students when they ask you to upload exercises on CMS because they can have more time to finish the work at home. Another faculty mentioned that he becomes interested in using CMS because of other instructors in his department who are using this technology for teaching.

Rogers' DOI Theory has been used by many researchers who have investigated adoption of new technology in higher education. Sahin (2006) believes it is "the most appropriate" theory for such investigation (p. 1). In his study on communication technology and diffusion of innovation, Liao (2005) believes that "Diffusion of innovation, with its practical implication on the adoption of technological innovations, can be used as a theoretical framework to understand [the adoption] of a web-based course management system" (p. 1). As well, Hazen, Wu, Sankar, and Jones-Farmer (2012), in their study on factors affecting education innovation dissemination, successfully used DOI Theory to understand why faculty would accept or reject the adoption of a new LMS.

Diffusion of Innovation Theory

Developed by E.M. Rogers in 1962, Diffusion of Innovation Theory is a behavioral change model that explains how or why an innovation diffuses through a social population with the end result of acceptance or adoption. Rogers (2003) defines diffusion as "the process in which an innovation is communicated through certain channels over time among the members of a social system." The idea is that the diffusion and adoption of an innovation don't happen

automatically, and that institutions promoting a change that want to better understand how to get that change to be accepted need to understand the stages and elements of how to achieve such acceptance or adoption. The theory names four components of the diffusion of innovation: innovation, communication channels, time, and social system. What follows is an explanation of each component as it relates to this study's focus —the diffusion and ultimate adoption of the Canvas LMS as an innovation at KSU.

Innovation

According to Rogers (2003), "An innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption" (p. 12). In the case of the adoption of the Canvas LMS at KSU, the innovation was using an LMS to enhance or in some cases even replace a more traditional platform of teaching and learning: the face-to-face lecture hall. For many faculty members at KSU, at the time that this technology was presented for consideration, the idea of using an LMS was considered an innovation that could help them communicate with and teach students in a new way.

Communication Channels

The second component of the DOI Theory is communication channels. For Rogers (2003), communication is "a process in which participants create and share information with one another in order to reach a mutual understanding" (p. 5). In the case of the LMS adoption at a university, the promoters of the innovation must communicate with those whose support and cooperation is needed for adoption and implementation of the innovation; promoters use communication channels to do this. Communication channels that are more social and personal than, for example, mass media such as TV or radio are needed. For instance, KSU could have made an advertisement for TV or radio about the benefits of LMSs for teaching, but, as discussed

by Sahin (2006), “interpersonal channels are more powerful to create or change strong attitudes held by an individual” (p. 1); within this framework, KSU’s reliance on faculty-to-faculty communication or other similar communication channels to get the word out about LMS benefits can be seen as strategic. Studying the specific interpersonal communication channels used by KSU could provide guidance and insight for other universities or groups in their own efforts to promote the adoption of a new technology such as an LMS.

Time

The third component in Rogers’ DOI Theory is the time it takes to adopt an innovation. Studying KSU’s process of adopting the Canvas LMS as a new innovation will help show how time needs to be accounted for and considered. Rogers identifies several points on the timeline of adoption (knowledge, persuasion, decision-making, implementation, and confirmation) and emphasizes that not all adopters of a new innovation will proceed from one point to the next at the same time; in the case of this study, looking at characteristics of faculty who took longer to adopt the innovation as compared to those who adopted the innovation more readily, or considering points along the timeline that took longer to move through, can provide insight into potential resistance or roadblocks to be aware of. Understanding how and why willingness or readiness to adopt an innovation might differ among those with different characteristics can better enable promoters of the innovation to preempt or at least respond to challenges that might arise.

Attributes of Innovations and Rate of Adoption

Within the component of time, Rogers elaborates on attributes of an innovation that can affect the time it takes for it to be adopted. These attributes are relative advantage, compatibility, complexity, trialability, and observability. In its investigation of how time impacted KSU’s

successful adoption of the Canvas LMS, this study will also examine how these innovation attributes may have affected the process of diffusion and eventual adoption.

Relative advantage

Relative advantage is "the degree to which an innovation is perceived as being better than the idea it supersedes" (Rogers, 2003, p. 229). Flexibility is an example of an innovation's relative advantage. In using an LMS for teaching, flexibility is a key advantage relative to the traditional face-to-face method of teaching. Instructors do not have to be in the classroom to communicate with students. In addition, learning materials can be easily uploaded into an LMS, independent of time and place. Many diffusion researchers indicate that relative advantage is one of the useful ways to predict the rate of adopting an innovation (Hafizah & Kamil, 2009, p. 59).

Compatibility

Compatibility is defined as "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (Rogers, 2003, p. 240). LMS as an innovation should meet the needs of the faculty members to be considered compatible. For instance, if an instructor is interested in collaborative learning between students, promoters of an LMS adoption should focus on communicating how an LMS can enhance this type of learning. Instructors should see clearly how an LMS would help improve their way of teaching; otherwise, there's risk of rejection. An LMS might not be accepted if it is inconsistent with users' needs. For instance, if the faculty members wishes or needs to use the German language to teach, and promoters of the LMS don't make clear that the LMS's default language can be changed, the innovation will likely be rejected. In the universities corpuses faculty may not be interested to integrate learning management system to their courses if there is evidence that LMS has week support (Black, Beck, Dawson, Jinks & Dipietro, 2007).

Pereira and Wahi (2017) found that compatibility is one of the most important factors of instructors' willingness to complete training for an LMS. This becomes a feedback loop – because with training, the instructors develop more experience with how to use the LMS and discover more features of the LMS that enhance its perceived compatibility. The instructor with more experience with the innovation has high perceptions of its compatibility. With the knowledge that the extent to which the compatibility of an innovation is made clear to potential adopters will impact the rate of its adoption, promoters of an innovation adoption can better plan their strategy for arriving at adoption and implementation.

Complexity

According to Rogers (2003), complexity is "the degree to which an innovation is perceived as relatively difficult to understand and use" (p. 257). It is very important that an LMS is perceived as user friendly for it to be adopted and expanded. Innovations are various in their degree of complexity – some of them are difficult, while others are clear. Rogers mentions that the first home computer in the United States was difficult for individuals who did not have computer skills to adopt. As a result, the home computer took a long time to become popular in the United States. In the case of LMS use, Mwaura (2004) found that instructors may have computer skills but if their familiarity with web-based platforms was lacking, the innovation's adoption may be slow or altogether rejected. Another factor related to complexity in the case of LMS adoption is pedagogy. Some instructors may need pedagogical training in order to use an LMS effectively. Pedagogy in face-to-face classrooms may not always translate to the online environment. If instructors perceive this as being too difficult to adapt to, the innovation may be perceived as being too complex. If that is the case, promoters of the innovation would need to

consider how professional development and training can link technology use to effective teaching methodology.

Trialability

Trialability is defined as "the degree to which an innovation may be experimented with on a limited basis" (Rogers, 2003, p. 258). In the case of an LMS adoption, a university may need to introduce the new system in stages or parts to allow instructors to use each part and develop personal experience that increases their understanding of how the LMS works. If users receive an innovation such as an LMS in one part that cannot be divided, it is likely to get rejected according to Rogers. Similarly, Hafizah, and Kamil (2009) indicate that trialability of internet innovations is one of the most important factors that should be considered in the adoption of internet tools among instructors.

Observability

Observability, according to Rogers (2003), is defined as "the degree to which the results of an innovation are visible to others" (p. 258). Observability depends on the nature of the innovation; some innovations may not be easy to observe. For example, technology software is observable but in a different way than hardware components, which can be recognized visually. Individuals tend to adopt innovations that are easily observed (p. 259).

As indicated, these attributes of innovation – relative advantage, compatibility, complexity, trialability, and observability – can impact the rate of an innovation's adoption. This study's inquiry into how these attributes were explained and communicated in KSU's process of adopting a new LMS will provide insight for King Saud University's process. Consideration of which attributes were seen as most important by KSU instructors and why could help another university in their adoption process.

Social System

After time, the fourth component of DOI Theory is the social system in which the innovation is diffused. Rogers (2003) defines social system as "a set of interrelated units that are engaged in joint problem solving to accomplish a common goal" (p. 23). The social system can affect the diffusion of innovation in different ways. For instance, the social system's leaders' opinions might affect the diffusion. According to Rogers (2003), "opinion leadership is the degree to which an individual is able to influence other individuals' attitudes or overt behavior informally in a desired way with relative frequency" (p. 27). In the case of this study on KSU's adoption of the Canvas LMS, looking at the university leadership's attitudes and opinions to see how they may have influenced the university's successful adoption of Canvas will be important. In addition, the culture of the perceived leaders among the faculty may have impacted of the diffusion and acceptance of Canvas as an innovation. As found by Collis (1999), culture plays a role in how the social system impacts an innovation's diffusion as well. Culture includes language, ethnicity, religion, and history. In the context of education and technology adoption, if the new technology is inconsistent with faculty members' cultural values or characteristics, they may reject it. It is essential to understand the impact of the social system in innovation diffusion and adoption.

Innovation Decision Process

In addition to looking at how these four components – innovation, communication channels, time, and social system – contained and influenced the spread (diffusion) of the idea of adopting the Canvas LMS at KSU, this study will also investigate the decision-making process through which the diffusion occurred. Rogers (2003) identifies five stages within this process (which he calls the Innovation Decision Process): knowledge, persuasion, decision,

implementation, and confirmation (p. 170). Investigating how this process manifested in the case of KSU's adoption of the Canvas LMS will help shed light on what might and what might not work in others' attempts at innovation diffusion and adoption.

Knowledge

Knowledge is the first stage of the innovation decision process and is a fundamental component of innovation diffusion and adoption. Through the lens of DOI Theory, the knowledge instructors at KSU had about using an LMS in general and Canvas in particular influenced their willingness to proceed to the next stage in the adoption process. What this study finds about KSU faculty's knowledge about LMS and Canvas could help King Saud University in their consideration of what knowledge their faculty need to favorably impact their willingness to adopt an LMS. Zeleny (2012) argues that people will use new technology when they know it is useful to them and will make their life easier. To achieve the adoption of an innovation, an organization needs to explain its benefits to the adopters/users. For example, an instructor facing challenges with engaging students in discussion and conversation due to the overwhelming size of the class would need knowledge about how an LMS could help him or her involve more students in a way that doesn't increase the demands on the instructor. Promoters of an innovation adoption need to understand what kind of knowledge will impact users' receptivity to the innovation. This study's look into how KSU discovered what their faculty needed to know in order to embrace the adoption of Canvas may be useful to King Saud's as they, too, consider what knowledge is beneficial to their faculty.

Persuasion

Persuasion is the next stage within the innovation decision process. In this stage, would-be adopters of an innovation develop a positive or negative attitude toward the change. Rogers

(2003) believes that individuals do not decide to adopt an innovation based on knowledge alone; equally important is seeing others like themselves using the new idea or innovation (p. 18, 19). According to Nicolle and Lou (2008), peer support is a fundamental component of integrating new technology among faculty members. For example, having informal meetings between instructors allows them to communicate and share their experiences with new technology. On the other hand, Tabata and Johnsrud (2008) found that if instructors who did not know how to use technology share their experience with other instructors, the motivation to use the learning technology tool will decrease. If a university's goal is to adopt or increase the use of an LMS among the instructors, it should create a strategy to improve faculty ability and understanding of new technology and then also a strategy to share their success stories with others in order to promote the adoption. Therefore, in this study's investigation of KSU's process of adopting Canvas, it will be important to consider the impact of instructors' experiences on others.

Decision

The next stage in the process is making a decision. In this stage, practice is crucial. In the case of this study, it will be important to investigate whether faculty members had opportunities to try Canvas to determine its usefulness. Rogers emphasizes that innovations that can be divided into parts are more likely to be adopted faster because users can test each part and then move to another. On the other hand, an innovation that cannot be separated into parts might face adoption issues. Another important consideration of innovation adoption is workload. Samarawickrema and Stacey (2007) emphasize that adopting technology such as a learning management system requires time, which is already in short supply for busy faculty. Offering an incentive to adopters of an innovation might play an important role in the speed of the adoption. This study will look at KSU's process of innovation adoption to see what incentives might have been offered – for

example, perhaps faculty using an LMS for the first time were compensated with a lighter course load. Such an incentive would allow the user to have more time exploring different features of the new system.

Implementation

Implementation of the innovation starts when an individual or group begins to use the innovation. In this study, it would be when faculty members move from thinking about and deciding to adopt to actually using the LMS, even if just for practice or as a trial. It is essential to provide support for users of an innovation in this period. “Here the role of change agents is mainly to provide technical assistance to the client as he or she begins to use the innovation” (Rogers, 2003, p. 179). In their study on technology adoption in higher education, Chou and Chou (2011) found that most faculty, when using a course management system for the first time, did not use the full features of the system and instead gradually applied them to their teaching method. It might be because users' skills, in the beginning, are not strong enough to explore complex features of a new technology. A study by Asiri, Mahmud, Bakar, and Ayub (2012) about the role of attitude in utilization of Jusur LMS in Saudi Arabian universities showed that faculty members at Saudi Universities have positive attitudes toward using an LMS (Blackboard) but that support was needed to enhance the integration of this technology. Because of the lack of technical support available and the low computer-use proficiencies of many students, the integration of Blackboard was not effective.

Confirmation

Confirmation is the last stage in the innovation decision process. It is critical at the confirmation stage to avoid dissonance because a user might reject the innovation. Instead, it is appropriate at this stage to provide users with positive messages that encourage them to keep

using the innovation. In the case of this study, Rogers' DOI theory helps explain why some faculty may stop using an LMS. According to Rogers, there are two types of discontinuance. The first one is replacement discontinuance, and that happens when individuals become interested in a new idea that he or she feels is better than the initial idea. The second type is disenchantment discontinuance. In this type, users reject an innovation because they are not satisfied with the result. In addition, new information about the innovation might encourage an individual to reject it. For instance, an official announcement that the innovation is not safe and might harm the users could cause a rejection after the adoption process. In the context of technology adoption at a university, this might be a computer virus that can be easily spread through the LMS communication platform. When an innovation has a high degree of adoption, however, the discontinuance level goes lower. By contrast, if the innovation has a low rate of adoption, the chance of discontinuance increased.

These five stages are vital to understanding the adoption of an innovation such as an LMS at a university. Each stage is considered a key to learning how to promote the adoption of technology among instructors.

Summary

This chapter review literature was related to adopting technology and LMSs among faculty members. Different learning approaches were covered to describe the usage of LMSs in educational settings. Negative and positive factors of adopting LMSs were presented as well as comparisons between social media and LMSs. In addition, personal characteristics of faculty members and organizational supports from the literature reviews were included in this chapter.

Diffusion of innovation theory is one of the most applicable behavioral change theories for understanding innovation adoption. Therefore, it provided the theoretical framework for this

study as it investigates how KSU diffused and eventually adopted the innovation of an LMS among its faculty members. Having a deep understanding of KSU faculty members' experiences of an LMS can improve other institutions' adoption process of an LMS.

In addition, this study investigated the effects of the LMS innovation's attributes on rate of adoption provided insight into why faculty members may accept or reject an LMS as a learning tool in the higher education environment. The study's research questions designed based on the five attributes of Rogers' DOI theory: 1) relative advantage, 2) compatibility, 3) complexity, 4) trialability, and 5) observability. Applying Rogers' DOI theory provided useful information that helps other promoters of an innovation in their adoption process.

Chapter 3 - Methodology

Chapter Overview

The goal of the study was to investigate the relationships between faculty personal characteristics (age, gender, years of teaching experience, academic ranking) and faculty members' adoption of learning management systems (LMSs) at Kansas State University and compare these with faculty members at King Saud University in Saudi Arabia. Many universities in Saudi Arabia are in the early stages of adopting and using e-learning tools, such as LMSs, to facilitate content learning. Therefore, there is a need to illustrate the impact of using LMSs within higher education contexts. This study aims to help Saudi instructors and university leaders determine the significant factors in successful adoption of LMSs in higher education. This chapter includes the research questions and methodology for this study. Additionally, the research design, participant selection, and the procedures for data collection presented as well as the reliability, validity and ethical considerations.

Research Questions

The study investigated relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experiences) and faculty members' adoption of LMSs at Kansas State University. The three research questions are as follows:

Research Question #1: What are the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and Rogers's five attributes of innovation (relative advantage, compatibility, complexity, trialability, observability)?

Null Hypotheses:

Ho 1.1. There are no statistically significant differences in faculty response regarding the five attributes of innovation (relative advantage, compatibility, complexity, trialability, observability) by faculty age.

Ho 1.2. There are no statistically significant differences in faculty response of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty gender.

Ho 1.3. There are no statistically significant differences in faculty response of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty academic ranking.

Ho 1.4. There are no statistically significant differences in faculty response regarding the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty years of teaching experience.

Research Question #2: What are the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and their perception of the organizational support related to the adoption of an LMS?

Null Hypotheses:

Ho 2.1. There are no statistically significant differences in faculty response regarding the organizational support related to the adoption of an LMS by faculty age.

Ho 2.2. There are no statistically significant differences in faculty response regarding the organizational support related to the adoption of an LMS by faculty gender.

Ho 2.3. There are no statistically significant differences in faculty response regarding the organizational support related to the adoption of an LMS by faculty academic ranking.

Ho 2.4. There are no statistically significant differences in faculty response regarding the organizational support related to the adoption of an LMS by faculty years of teaching experience.

Research Question #3: What are the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and additional characteristics (time concern, fear of change of new technology) related to the adoption of an LMS?

Null Hypotheses:

Ho 3.1. There are no statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty age.

Ho 3.2. There are no statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty gender.

Ho 3.3. There are no statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty academic ranking.

Ho 3.4. There are no statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty years of teaching experience.

Research Design

A cross-sectional descriptive design is the research approach that used to explore the adoption of an LMS in higher education from the perspectives of faculty members at Kansas

State University because it is the most successful way of obtaining descriptive information. According to deVaus (2001),

> A cross-sectional design can be ideal for descriptive analysis. If we simply want to describe the characteristics of a population, their attitudes, their voting intention or their buying patterns then the cross-sectional survey is a most satisfactory way of obtaining this descriptive information (p. 175).

In addition, the purpose of using survey research is to generalize the findings from the sample to the population (Babbie, 1990). The data collected through closed-ended survey questions delivered electronically through Qualtrics. Data gathered at the same time from faculty members at Kansas State University.

Research setting

The research took place in two public universities. The first, Kansas State University in Manhattan, Kansas, was the first public university in Kansas, opening in 1863 as the state's land-grant college. KSU's main campus is in Manhattan, Kansas, in the United States. In 2016-2017 K-State had an enrollment of 19,472 undergraduate students and 4,307 graduate students. It is known for research and its campus life and is a place of diversity. In addition, it is a welcoming community for international students. K-State offers a variety of academic majors including graduate certificates, master's degree programs, doctoral degree programs, and 250 undergraduate majors. Furthermore, K-State has more than 1400 full-time faculty members, many of whom are nationally recognized for their research. (About K-State, 2017).

King Saud University is a public university in Riyadh, Saudi Arabia, and founded in 1957 as the first university in Saudi Arabia. College of Art was the first discipline in 1957. Nowadays, the university has an enrolment of over 62,000 students studying in 19 colleges that cover

different fields, such as natural sciences, humanities, and health (Ministry of Education, 2016).

Participants

The study population included male and female faculty members, including professors, associate professors, and assistant professors, from all colleges at Kansas State University. The study included the colleges of Agriculture, Architecture, Planning and Design, Arts and Sciences, Business Administration, Education, Engineering, Health and Human Sciences and Veterinary Medicine. The total number of the population studied was 1,605 faculty members. There were 403 survey respondents with a 25% response rate.

Table 3.1 Kansas State University Participants

Department	Faculty number
Agricultural Economics	34
Agronomy	38
Animal Sciences & Industry	53
Communication and Ag Education	10
Entomology	17
Grain Science & Industry	18
Horticulture Forestry & Recreation	28
Plant Pathology	25
Architecture	27
Interior Arch & Product Design	13
Landscape Arch/Reg & Comm Plan	20
Aerospace Studies	5
Art	27
Biochem Molecular Biophysics	18
Biology	54
Chemistry	22
Economics	18
English	61
Geography	16
Geology	16
History	23
Journalism & Mass Communication	22
Mathematics	42
Military Science	22
Modern Languages	28
School of Music Theatre Dance	62

Department	Faculty number
Philosophy	13
Physics	32
Political Science	21
Psychological Sciences	23
Sociology Anthropology & Social Work	39
Communication Studies	15
Statistics	16
Womens' Studies	6
American Ethnic Studies	10
Accounting	19
Finance	16
Management	33
Marketing	17
K-State Global Campus	31
4-H Youth Development	5
Agriculture & Natural Resource	2
Dean of Education	17
Educational Leadership	26
Curriculum and Instruction	43
Spec Ed Counseling & Stud Affairs	28
School of Leadership Studies	14
Biological & Agricultural Engr	14
Architectural Engineering & Construction Sciences	17
Chemical Engineering	12
Civil Engineering	17
Computing & Information Sciences	21
Electrical & Computer Engineering	27
Industrial & Manufacturing System Engineering	14
Mechanical & Nuclear Engineering	31
Kansas Industrial Extension System	9
K-State Olathe	5
Dean of Health and Human Sciences	22
Apparel Textiles & Interior	12
Hospitality Management and Dietetics	9
Human Nutrition	24
Family Studies & Human Service	65
Kinesiology	15
Extension Nutrition Program	5
Dean of Veterinary Medicine Center	6
Anatomy & Physiology	28
Diagnostic Medicine Pathobiology	39
Clinical Sciences	47
Veterinary Health Center	3
Veterinary Diagnostic Lab	18

Department	Faculty number
	1605

King Saud University participants are from 19 colleges, including College of Engineering, College of Science, College of Food and Agricultural Sciences, College of Computer and Information Sciences, College of Architecture and Planning, College of Business Administration, College of Law and Political Sciences, College of Languages and Translation, College of Tourism and Archeology, College of Sport Sciences and Physical Activity, College of Education, College of Arts, College of Medicine, College of Pharmacy, College of Nursing, College of Applied Medical Sciences, College of Dentistry, and College for Emergency Medical Services, and Arabic Language Institute. There are approximately 6.322 faculty members at the university, there were 104 survey respondents with a 1.64% response rate.

Table 3.2 King Saud University Faculty members.

Gender	Saudi	International	Total
Male	2,722	1,361	4,083
Female	1,935	304	2,239
Total	4,657	1,665	6,322

(Omar, 2016)

Data Collection Methods

Data collected through closed-ended survey questions. Using a survey format allows the researcher to reach more faculty members, which is important to generalize the research

findings. In addition, a lot of researchers believe that using a survey gives them an opportunity to find out about individuals' beliefs, attitudes, and experiences (Weisberg, Krosnick and Bowen,1996).

An electronic survey sent to the participants through Qualtrics. Convenience is a great feature of a web survey because it allows respondents to use their laptop, tablet or smartphone to answer the survey questions. According to Dillman, Smyth, & Christian (2014), "Obtaining responses to a questionnaire in today's environment often requires getting an electronic survey request successfully through a prescreening on a smartphone" (p. 11). I distributed the survey to a contact list of faculty members at Kansas State University. The list was created by the IT Help Desk at the university. The survey was open for one month to give the participants enough time to participate. A follow-up email with a link emailed every four days after Qualtrics sends out the initial survey because individuals tend to forget if they do not receive a reminder after a short time (Yun & Trumbo,2000). On the other hand, the survey distribution at King Saud University was through the Questionnaire center at the university.

Survey preparation

The survey included 63 items divided into four sections. The first section was about Rogers' five attributes of innovation: 1) relative advantage, 2) compatibility, 3) complexity, 4) trialability, and 5) observability. Forty-eight items were used to measure these attributes. The second section was about the organizational support. Five items were used to find the relationship between organizational support and the adoption decision of an LMS. The third section was about the two factors (time concern and fear of change and new technology) that might inhibit faculty members at Kansas State University from adopting a new learning management system. Ten items were used for these two factors. The last section was the

demographic questions to identify the participants. Four items were used to collect information about the respondent.

Validity

Dillman, Smyth, & Christian, (2009) mentioned that a great survey should be built to measure researcher ideas and questions. This current research intends to investigate the relationship between faculty personal characteristics (age, gender, years of teaching experience, academic ranking) and their adoption of a learning management system (LMS) at Kansas State University. To achieve this goal, a combination of surveys that have been tested with other studies used. Gay (1996) indicated that validity is the "…degree to which a test appears to measure what it purports to measure" (p. 139-140). Gay's definition provides a clear idea about the standard of validity in these studies.

A survey revised from Keesee (2010) was used to devise the first research question, which is about Rogers' diffusion of innovation theory, and the second research question, which is about organizational support. The survey was tested by experts in Rogers' theory to make sure the items designed effectively measured the five attributes of innovation and organizational support. The last research question, which includes two categories (time concern and fear of change of new technology), influence faculty use of learning management systems. It was adapted from Walker (2014). Moreover, the survey reviewed by researchers to make sure the survey items are consistent with the research questions.

Reliability

Reliability refers to whether "…scores from an instrument are stable and consistent. Scores should be nearly the same when researchers administer the instrument multiple times at different times" (Creswell, 2012, p. 159). To confirm the reliability of the research instruments,

Cronbach's Alpha was used for the survey items. "The Cronbach Alpha provides a coefficient of inter-item correlations, that is, the correlation of each item with the sum of all the other relevant items, and is useful for multi-item scales" (Cohen, 2000, P.148). Moreover, it is one of the most commonly used tests for reliability purposes. "Cronbach's Alpha is the most widely used measure of reliability that measures the internal consistency reliability" (Aron, Aron, & Coups, 2005, p. 383). In social sciences, a Cronbach's Alpha of .6 or .7 or more than that is better (Aron, Aron, & Coups, 2005).

Cronbach's alpha test was used by the Keesee (2010) study for the five attributes of Rogers' theory. The reliability coefficients for each variable were relative advantage (.96), compatibility (.89), complexity (.91) trialability (.74), and observability (.73). Furthermore, organizational support, which is the independent variable for the second research question, demonstrated an alpha of .88 (Keesee, 2010).

The third research question, which includes two independent variables (time concerns and fear of change of new technology), were revised from Walker (2014). The reliability coefficients were .68 for time concerns and .89 for fear of change of new technology (Walker, 2014).

Pilot Test of Survey Instrument

Because there are Arabic faculty members who participated in the study, the researcher translated the survey into Arabic. A copy of the translated questionnaire is presented in Appendix(C). The survey instrument was tested on a group of people who study in the United States. The samples for the pilot test were Saudi graduate students who know both Arabic and English as well as a Saudi assistant professor of linguistics. Following their comments, changes were made to complete the survey for data collection.

Data Analysis

The researcher used SPSS software to analyze the data. Descriptive statistics used to analyze the data collected from the closed-ended questions. Additionally, Multivariate Analysis of Variance (MANOVA) tests were used to find values of significance.

- A response to research question one, to assess the relationship between Rogers' five attributes of innovation and faculty personal characteristics with LMS MANOVA tests, were collected. The five independent variables in MANOVA tests were variables that represent Rogers' five attributes of innovation (relative advantage, compatibility, complexity, trialability, observability).
- A response to research question two regarding the relationship between faculty personal characteristics and their perception of the organizational support obtained through an ANOVA test.
- A response to research question three, which was about the two factors which might inhibit faculty members from adopting a learning management system (time concern and fear of change and new technology), collected by using MANOVA tests.

Table 3.3 Research questions with survey items

Research Question	Variable	Survey Questions
Research Question #1	• Relative advantage • Compatibility • Complexity • Trialability • Observability • Age • Gender • Academic ranking • Years of teaching experience	From 1- 46 Demographic Section

Research Question #2	● Organizational support ● Age ● Gender ● Academic ranking ● Years of teaching experience	From 46- 65 Demographic Section
Research Question #3	● Time concern ● Fear of change of new technology ● Age ● Gender ● Academic ranking ● Years of teaching experience	From 65- 75 Demographic Section

Independent Variables

According to Field (2013), an independent variable is "manipulated by the experimenter and so its value does not depend on any other variables experimenter" (p. 877). In the study, there are different independent variables:

1. Rogers' five attributes of innovation (relative advantage, compatibility, complexity, trialability, observability)
2. Organizational support related to the adoption of the learning management system
3. Factors inhibiting faculty members from adopting a learning management system (time concern and fear of change and new technology)

Dependent Variables

The dependent variables of the study are the faculty personal characteristics:

1. Age
2. Gender

3. Academic rank
4. Years of teaching experience

Descriptive Statistics

Descriptive statistics are “Statistics that are reported merely as information about the sample of observation included in the study and that are not used to make inferences about some larger population” (Warner, 2013, p. 1082). In the analysis process of the study, descriptive statistics covered the demographic sections of the participants (age, gender, academic rank and years of teaching experiences). It provided rich information about the participants in the study by describing the range of their personal characteristics. Tables and figures included in the descriptive section.

Inferential Statistics

Inferential statistics used “to look at scores from a sample and use the results to draw inferences or make predictions about the population” (Creswell, 2012, p. 187). A series of one-way Multivariate Analysis of Variance (MANOVA) tests were conducted (An alpha level of .05 or less has been selected for this study). In addition, an Analysis of Variance (ANOVA) was performed in order to identify values of significance between groups.

Ethical Considerations

The Kansas State University Institutional Review Board (IRB) approval was ready before conducting the study as part of the requirement for research involving human subjects. The participants in the study received detailed information about the goal of the study. The researcher explained the advantages of participating in this study. In addition, participants were informed that their names and personal information were safe. The participants had the right to continue or stop anytime they wanted. Moreover, the participants had a chance to access the study findings.

Data was stored in a safe place to ensure protection of the participants' data. In addition, the researcher received approval to gather information from faculty members from King Saud University as well.

Chapter 4 - Findings

Chapter Overview

The goal of the study was to investigate the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experiences) at Kansas State University and their adoption of a learning management system (LMS) and compare that with King Saud University in Saudi Arabia. The study used closed-ended survey questions for two groups. The first group contained faculty members at Kansas State University; the second group was composed of faculty members at King Saud University. In order to find the differences related to faculty personal characteristics between the users in two different learning environments. SPSS software was used for all data analysis and performing tables.

In this chapter, data analysis and findings were presented in two sections. The first section shows descriptive statistics of the participants' demographic characteristics (age, gender, years of teaching experiences, and academic ranking). The second section presents inferential statistics, which illustrates the results from the MANOVA tests for the research questions. If the MANOVA reveals statistically significant differences, an Analysis of Variance (ANOVA) was performed in order to identify values of significance. Moreover, a series of post hoc tests were conducted to determine the differences between groups.

Descriptive Statistics

Characteristics of the Participants

Faculty members' personal characteristics at Kansas State University include age, gender, academic rank, and years of teaching experience. This section illustrated the characteristics of the participants in this study in the following tables and figures.

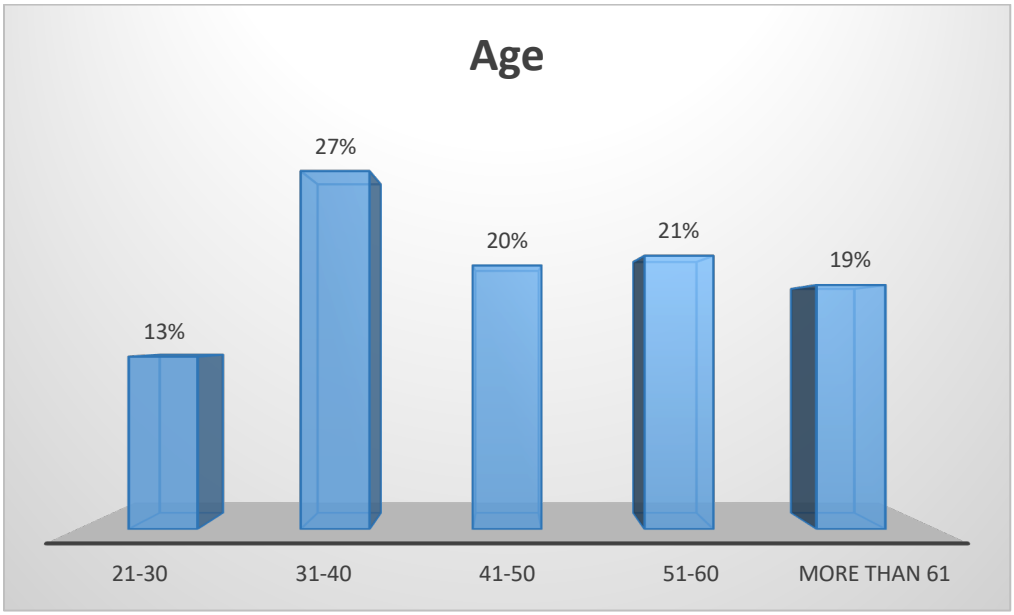
Age

Table 4.1 shows that 13% of the participants were between the age of 21-30, 27% of the participants were in the age of 31-40, 20% of the participants were in the age of 41- 50, 20% of the participants were in the age range of 51- 60, and 18% of the participants were older than 61.

Table 4.1 Respondents' Age

Age	N	Percent
21 - 30	53	13.2
31 - 40	110	27.3
41 -50	81	20.1
51 - 60	84	20.8
More than 61	75	18.6
Total	403	100.0

Figure 4.1 Respondents' Age



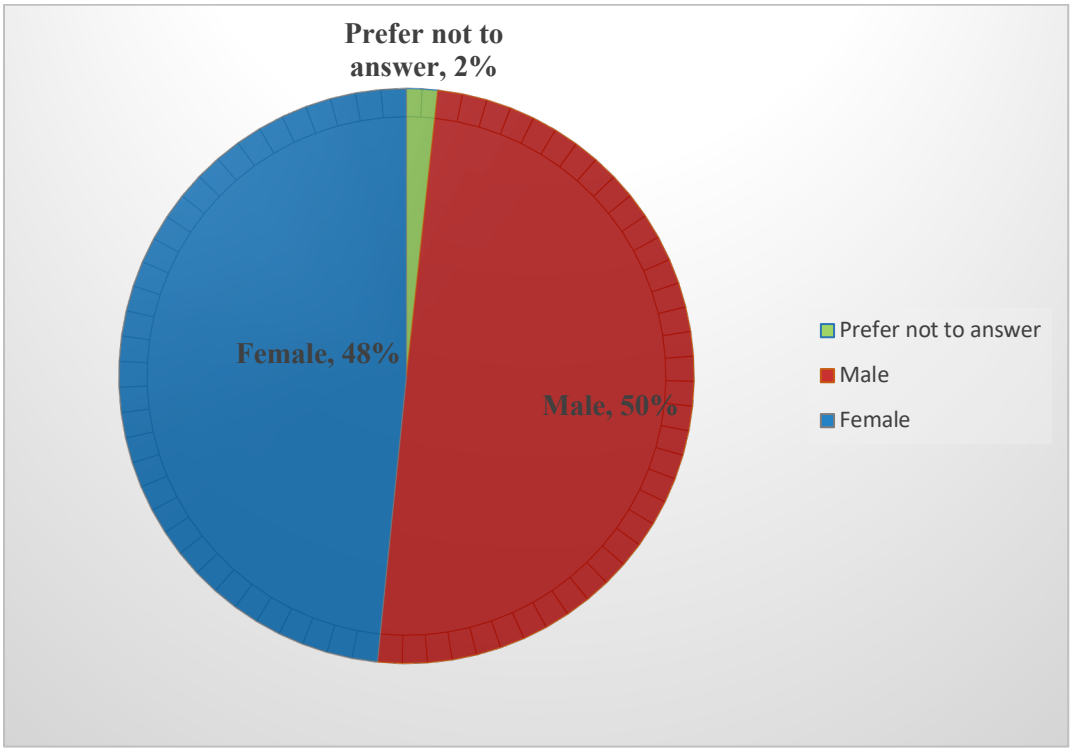
Gender

Table 4.2 shows the gender of the respondents. Two percent of the participants preferred not to answer, 50% of the participants were male, and 48% of the participants were female.

Table 4.2 The Gender of Respondents

Gender	N	Percent
Prefer not to answer	7	2
Male	201	50
Female	195	48
Total	403	100.0

Figure 4.2 The Gender of Respondents



Academic Rank

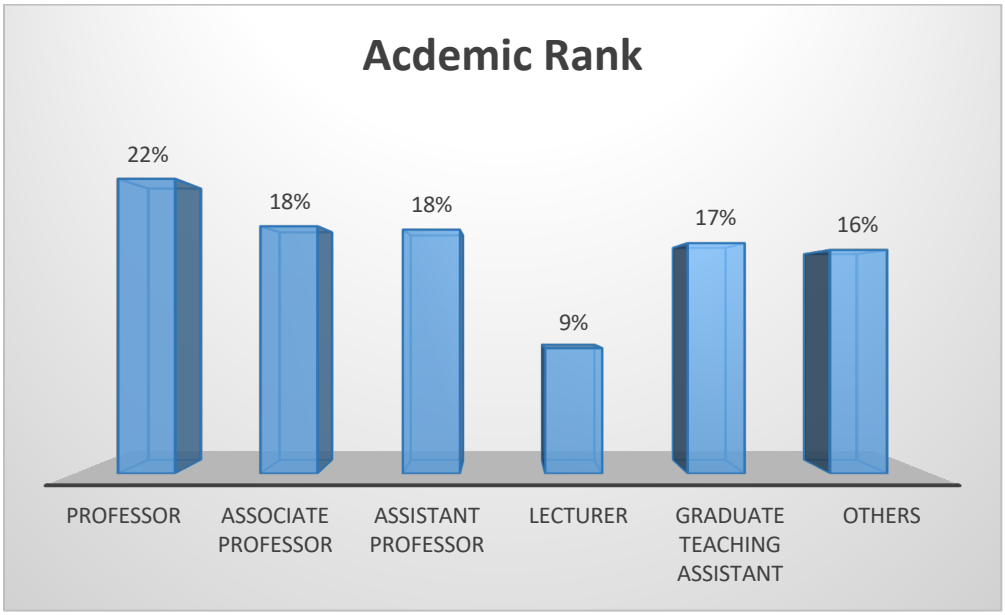
Table 4.3 shows that professors constituted 21% of the participants, associate professors comprised 18% of the participants, assistant professors represented 17% of the participants, lecturers made up 9% of the participants, graduate teaching assistants (GTAs) represented 16%, and the last group included other faculty members such as instructors, representing 16% of the total group.

Table 4.3 Faculty Members' Academic Rank

Academic Rank	N	Percent

Professor	87	21.6
Associate Professor	73	18.1
Assistant Professor	72	17.9
Lecturer	37	9.2
Graduate Teaching Assistant (GTA)	68	16.9
Others	66	16.4
Total	403	100.0

Figure 4.3 Faculty Members' Academic Rank



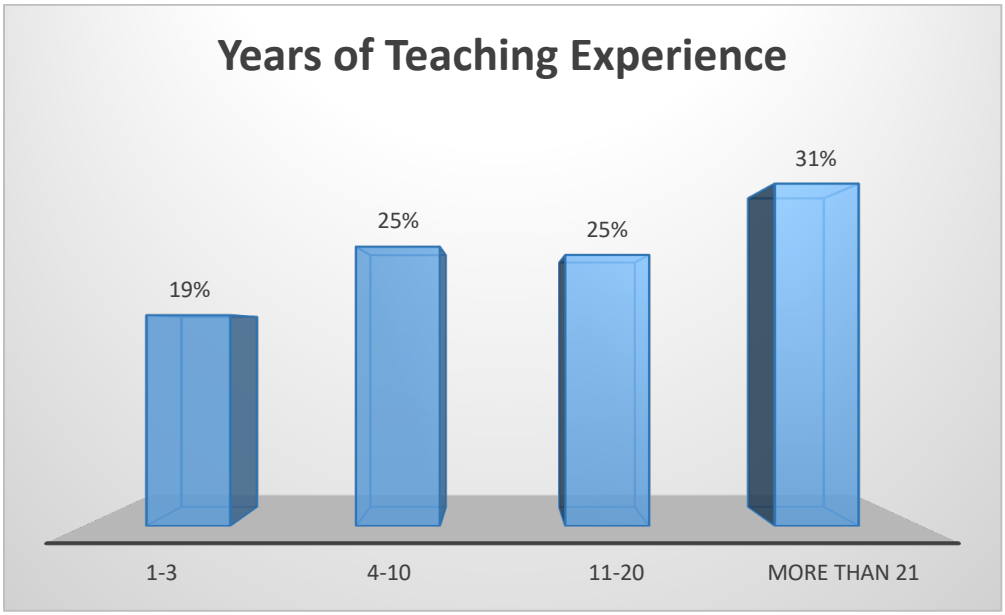
Years of teaching experience

Table 4.4 shows that 19% of the participants had 1 – 3 years of teaching experience, 25% of the participants had 4-10 years, 24% of the participants had 11 - 20 years, and 31% of the respondents had more than 21 years of teaching experience.

Table 4.4 Range of Teaching Experience Among Respondents

Years of Teaching Experience	N	Percent
1 - 3	77	19.1
4 - 10	102	25.3
11 - 20	99	24.6
More than 21	125	31.0
Total	403	100.0

Figure 4.4 Range of Teaching Experience Among Respondents



Characteristics of King Saud University Participants

Faculty members' personal characteristics at King Saud University include age, gender, academic rank, and years of teaching experience. This section illustrates the characteristics of the participants in this study through tables and figures.

Age

Table 4.5 shows that 5% of the participants were between the age of 21-30, 48% of the participants were between the age of 31-40,18% of the participants were between the age of 41-50, 23% of the participants were between the age of 51- 60, and 4% of the participants were more than 61 years old.

Table 4.5 Respondents' Age

Age	Frequency	Percent
23 - 30	6	5.8
31 - 40	50	48.1
41 -50	19	18.3
51 - 60	24	23.1
More than 61	5	4.8

Total	104	100.0

Gender

Table 4.6 shows the gender of the respondents. Two percent of the participants preferred not to answer, 46. % of the participants were male and 52% of the participants were female

Table 4.6 Respondents' Gender

Gender	Frequency	Percent
Male	48	46.2
Female	54	51.9
Preferred not to answer	2	1.9
Total	104	100.0

Academic Rank

Table 4.7 shows that professors comprised 9.6% of the participants, associate professors were 8.7% of the participants, assistant professors represented 39.4% of the participants, lecturers constituted 33.7% of the participants, and graduate teaching assistants (GTAs) represented 8.7% of the total group/participants.

Table 4.7 Faculty Members' Academic Rank

Academic Rank	Frequency	Percent
Professor	10	9.6
Associate Professor	9	8.7
Assistant Professor	41	39.4
Lecturer	35	33.7
Teaching Assistant	9	8.7
Total	104	100.0

Years of Teaching Experiences

Table 4.8 shows that 15.4% of the participants had 1-3 years of teaching experience, 34.6% of the participants had 4-10 years of teaching experience, 31.7% of the participants had 11 - 20 years of teaching experience, and 18.3% for the last group, which had more than 21 years of teaching experience.

Table 4.8 Range of Teaching Experience Among Respondents.

Years of Teaching Experience	Frequency	Percent
1 - 3	16	15.4
4 - 10	36	34.6
11 - 20	33	31.7
More than 21	19	18.3
Total	104	100.0

Inferential Statistics

This section presents the results and statistical analysis for the research questions. Different statistical tests were used to analyze the results, starting with a Multivariate Analysis of Variance (MANOVA) test. When the MANOVA revealed statistically significant differences, an Analysis of Variance (ANOVA) was performed in order to identify values of significance. Afterward, a series of post hoc tests were conducted to determine any differences between groups.

Research Questions

The study investigated the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) at Kansas State University and their perception and use of a learning management system (LMS) and compare the findings with personal characteristics of faculty from King Saud University in Saudi Arabia. There are three research questions.

Research Question One

What are the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and Rogers's five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability)?

In order to determine the relationship between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and Rogers's five attributes of innovation, four one-way MANOVA tests were conducted. All five dependent variables (relative advantage, compatibility, complexity, trialability, and observability) were tested.

Table 4.9 Pillai's Trace Test Result of MANOVA on Rogers's Five Attributes of Innovation for Kansas State University

Independent Variables		Value	F	Hypothesis df	Error df	Sig.
Age	Pillai's Trace	.122	1.794	20.000	1140.000	.017
Gender	Pillai's Trace	.080	2.368	10.000	566.000	.009
Years of teaching Experience	Pillai's Trace	.088	1.722	15.000	852.000	.042
Academic Rank	Pillai's Trace	.189	2.244	25.000	1430.000	.000

Table 4.10 Pillai's Trace Test result of MANOVA on Rogers's five attributes of innovation King Saud University

Effect		Value	F	Hypothesis df	Error df	Sig.
Age	Pillai's Trace	.224	.700	20.000	236.000	.825
Gender	Pillai's Trace	.204	1.292	10.000	114.000	.243
Years of teaching Experience	Pillai's Trace	.247	1.042	15.000	174.000	.415
Academic Rank	Pillai's Trace	.295	.940	20.000	236.000	.537

Test of Null Hypothesis

- **King Saud University**

Ho 1.1. There are no statistically significant differences in faculty response of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty age.

Result

Pillai's Trace test results showed no a statistically significant difference between faculty characteristics (age, gender, years of teaching experiences and academic rank) at King Saud University.

Table 4.10 shows statistically significant differences between faculty age and respondents' perceptions of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability). The results were V = .224, F (20, 236) = .700, and a p = .825. In this case, the participants' answers were not influenced by their age. As a result, the null hypothesis Ho 1.1 was accepted.

Ho 1.2. There were no statistically significant differences in faculty response of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty gender.

Result

Pillai's Trace Test result shows no a statistically significant difference between faculty gender and respondents' perception of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability), The results were V = .204, F (10,114) = 1.292 p = .243. In this case, the participants' answers were not influenced by their gender. As result, the null hypothesis Ho 1.2 was accepted.

Ho 1.3. There are no statistically significant differences in faculty response of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, observability) by faculty years of teaching experience.

Result

Pillai's trace test result shows no statistical difference between faculty gender and a respondent's perception of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) The results were V = .247, F (15,174) =1.042, p = .415. In this case, the participants' answers were not influenced by how many years each faculty member had been teaching. As result, the null hypothesis Ho 1.3 was accepted.

Ho 1.4. There are no statistically significant differences in faculty responses of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty academic ranking.

Result

Pillai's trace test result shows no statistical difference between faculty academic ranking and respondents' perceptions of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability). The results were V = .295, F (20,236) =.940, p = .537. In this case, the participants' answers were not influenced by faculty academic ranking. As a result, the null hypothesis Ho 1.4 was accepted.

- **Kansas State University**

Ho 1.1. There are no statistically significant differences in faculty response of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty age.

Result

Pillai's Trace test results shows a statistical difference between faculty characteristics (age, gender, years of teaching experiences and academic rank) at Kansas State University.

Table 4.9 shows statistically significant differences between faculty age and respondents' perceptions of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability). The results were V = .122, F (20, 1140) = 1.794, and a p = .017. In this case, the participants' answers were influenced by their age. As a result, the null hypothesis Ho 1.1 was rejected. To determine the significance among dependent variables, an Analysis of Variance (ANOVA) test was conducted.

Table 4.11 ANOVA Significance Values of five Attributes of Innovation by Age

		Sum of Squares	df	Mean Square	F	Sig.
Relative Advantage	Between Groups	7.307	4	1.827	3.453	.009
	Within Groups	210.530	398	.529		
	Total	217.837	402			
Compatibility	Between Groups	11.526	4	2.882	5.668	.000
	Within Groups	202.355	398	.508		
	Total	213.881	402			
Complexity	Between Groups	25.198	4	6.300	10.295	.000
	Within Groups	243.533	398	.612		
	Total	268.732	402			
Trialability	Between Groups	1.508	4	.377	.674	.611
	Within Groups	222.735	398	.560		
	Total	224.243	402			
Observability	Between Groups	13.577	4	3.394	8.228	.000
	Within Groups	164.183	398	.413		
	Total	177.761	402			

According to the ANOVA test, four attributes of innovation were found to be a statistically significant, including relative advantage (p = .009), compatibility (p =.000), complexity (p = .000), and observability (p = .000). Trialability of innovation was not significant (p =.611). In

order to illustrate the difference among participants, a Tukey post hoc test was conducted as follows.

Table 4.12 Tukey Post Hoc Test for Age with Attributes of Innovation

Dependent Variable	(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.
Relative Advantage	21 - 30	31 - 40	.26790	.12161	.181
		41 -50	.40993*	.12850	.013
		51 - 60	.19870	.12758	.526
		More than 61	.40822*	.13051	.016
	31 - 40	21 - 30	-.26790	.12161	.181
		41 -50	.14204	.10649	.670
		51 - 60	-.06920	.10539	.965
		More than 61	.14033	.10891	.699
	41 -50	21 - 30	-.40993*	.12850	.013
		31 - 40	-.14204	.10649	.670
		51 - 60	-.21123	.11326	.338
		More than 61	-.00171	.11655	1.000
	51 - 60	21 - 30	-.19870	.12758	.526
		31 - 40	.06920	.10539	.965
		41 -50	.21123	.11326	.338
		More than 61	.20952	.11554	.367
	More than 61	21 - 30	-.40822*	.13051	.016
		31 - 40	-.14033	.10891	.699
		41 -50	.00171	.11655	1.000
		51 - 60	-.20952	.11554	.367
Compatibility	21 - 30	31 - 40	.24983	.11923	.224
		41 -50	.39864*	.12598	.014
		51 - 60	.20481	.12508	.474
		More than 61	.55669*	.12795	.000
	31 - 40	21 - 30	-.24983	.11923	.224
		41 -50	.14882	.10440	.612
		51 - 60	-.04502	.10332	.992
		More than 61	.30686*	.10678	.034
	41 -50	21 - 30	-.39864*	.12598	.014
		31 - 40	-.14882	.10440	.612
		51 - 60	-.19384	.11104	.407

		More than 61	.15805	.11426	.639
	51 - 60	21 - 30	-.20481	.12508	.474
		31 - 40	.04502	.10332	.992
		41 -50	.19384	.11104	.407
		More than 61	.35188*	.11328	.017
	More than 61	21 - 30	-.55669*	.12795	.000
		31 - 40	-.30686*	.10678	.034
		41 -50	-.15805	.11426	.639
		51 - 60	-.35188*	.11328	.017
Complexity	21 - 30	31 - 40	.17065	.13080	.688
		41 -50	.51854*	.13820	.002
		51 - 60	.43697*	.13722	.013
		More than 61	.76126*	.14037	.000
	31 - 40	21 - 30	-.17065	.13080	.688
		41 -50	.34789*	.11453	.021
		51 - 60	.26632	.11335	.132
		More than 61	.59061*	.11714	.000
	41 -50	21 - 30	-.51854*	.13820	.002
		31 - 40	-.34789*	.11453	.021
		51 - 60	-.08157	.12181	.963
		More than 61	.24272	.12535	.300
	51 - 60	21 - 30	-.43697*	.13722	.013
		31 - 40	-.26632	.11335	.132
		41 -50	.08157	.12181	.963
		More than 61	.32429	.12427	.071
	More than 61	21 - 30	-.76126*	.14037	.000
		31 - 40	-.59061*	.11714	.000
		41 -50	-.24272	.12535	.300
		51 - 60	-.32429	.12427	.071
Observability	21 - 30	31 - 40	.33413*	.10739	.017
		41 -50	.43559*	.11347	.001
		51 - 60	.24523	.11267	.191
		More than 61	.62201*	.11525	.000
	31 - 40	21 - 30	-.33413*	.10739	.017
		41 -50	.10146	.09404	.817
		51 - 60	-.08891	.09307	.875
		More than 61	.28788*	.09618	.024
	41 -50	21 - 30	-.43559*	.11347	.001

	31 - 40	-.10146	.09404	.817
	51 - 60	-.19037	.10002	.317
	More than 61	.18642	.10292	.368
51 - 60	21 - 30	-.24523	.11267	.191
	31 - 40	.08891	.09307	.875
	41 -50	.19037	.10002	.317
	More than 61	.37679*	.10204	.002
More than 61	21 - 30	-.62201*	.11525	.000
	31 - 40	-.28788*	.09618	.024
	41 -50	-.18642	.10292	.368
	51 - 60	-.37679*	.10204	.002

*. The mean difference is significant at the 0.05 level.

Relative Advantage

There was a statistical difference between users that were 21-30 years old and 41-50. faculty who were older than 61 had an *M* of .40993 and a *P* of .013 compared to the individuals in the age group of 41-50 where *M*=.40822 and *P* = .016.

Compatibility

There was a statistical difference between users that were 21-30 years old and 41-50 years old. Faculty who were older than 61 had an *M*=.39864 and a *P* = .014, while participants aged 41-50 had an *M* of .55669 and a *P* of .000.

Complexity

There was a statistical difference between users that were 21-30 years old and users in the 41-50, 51-61 and greater than 61-years-old categories. There was an *M* of .51854 and a *P* of .002 for users in the 41-50-year-old category, an *M*=.43697 and a *P* = .013 for users in the 51-61-year-old category, and an *M* of .76126 and a *P* of .000 for faculty who were older than 61.

Similarly, there was a statistical difference between users in the 31-40-year-old category and the 41-50-years old category and for users in the 31-40-year-old category and 61-and-up years. There was an *M* of .34789 and a *P* of .021 when comparing the participants in the 31-40

and 41-50-years-old categories, and an *M* of.59061 and a *P* of .000 when comparing participants who were in the 31-40 and 61 and greater categories.

Observability

There was a statistical difference between users that were 21-30 years old and three age groups of 31-40, 41-50 and over 61 regarding to the observability of the Canvas LMS. There was an *M* of 33413 and a *P* of .017 for users in the 31-40-year-old category, an *M*=.43559 and a *P* = .001 for users in the 41-50 years old category and an *M* of 62201 and a *P* of .000 for faculty who were older than 61. There was a statistical difference between users in the 31-40 age group and the users in the 61and above age group on the observability of the Canvas LMS. an *M* of 28788 and a *P* of .024 with groups age More than 61. There was also a statistical difference between users in the 51-60 years old category and the 61and older age groups on the observability of the Canvas LMS.an *M*=.37679 and a *P* = .002 for faculty who were older than 61.

Ho 1.2. There were no statistically significant differences in faculty response of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty gender.

Result

Pillai's Trace Test result shows a statistically significant difference between faculty gender and respondents' perception of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability), The results were V = .080, *F* (10, 566) = 2.368 *p* = .009. In this case, the participants' answers were influenced by their gender. As result, the null hypothesis Ho 1.2 was rejected. Moreover, to determine the significance difference among dependent variables, an Analysis of Variance (ANOVA) test was conducted.

Table 4.13 ANOVA Significance Values of five Attributes of Innovation by Gender.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Relative Advantage	Between Groups	11.220	2	5.610	10.861	.000
	Within Groups	206.617	400	.517		
	Total	217.837	402			
Compatibility	Between Groups	6.004	2	3.002	5.776	.003
	Within Groups	207.877	400	.520		
	Total	213.881	402			
Complexity	Between Groups	3.317	2	1.659	2.500	.083
	Within Groups	265.414	400	.664		
	Total	268.732	402			
Trialability	Between Groups	3.676	2	1.838	3.333	.037
	Within Groups	220.568	400	.551		
	Total	224.243	402			
Observability	Between Groups	1.177	2	.589	1.334	.265
	Within Groups	176.583	400	.441		
	Total	177.761	402			

The ANOVA test shows that three of the attributes of innovation were found to be statistically significant. The results were relative advantage (p = .000), compatibility (p =.003), trialability (p = .037. However, two dependent variables of innovation (Complexity (p = .083) and Observability (p = .265), were not statistically significant. In order to illustrate the difference among participants, a Tukey post hoc test was conducted.

Table 4.14 Tukey Post Hoc Test for Gender with Attributes of Innovation

Dependent Variable	(I) Gender	(J) Gender	Mean Difference (I-J)	Std. Error	Sig.
Relative Advantage	Prefer not to answer	Male	-.59767	.27634	.079
		Female	-.87332*	.27648	.005
	Male	Prefer not to answer	.59767	.27634	.079
		Female	-.27565*	.07224	.000
	Female	Prefer not to answer	.87332*	.27648	.005
		Male	.27565*	.07224	.000
Compatibility	Prefer not to answer	Male	-.64310	.27718	.054

		Female	-.79993*	.27732	.011
	Male	Prefer not to answer	.64310	.27718	.054
		Female	-.15683	.07246	.079
	Female	Prefer not to answer	.79993*	.27732	.011
		Male	.15683	.07246	.079
Trialability	Prefer not to answer	Male	-.73644*	.28551	.028
		Female	-.72015*	.28566	.032
	Male	Prefer not to answer	.73644*	.28551	.028
		Female	.01629	.07464	.974
	Female	Prefer not to answer	.72015*	.28566	.032
		Male	-.01629	.07464	.974

*. The mean difference is significant at the 0.05 level.

Relative advantages

The Tukey post hoc test revealed that female participants an *M* of .87332 and a *SD* of .27648 had a higher mean with regard to relative advantages than male participants an *M* of .59797 and a *SD* of .27634. In addition, female participants had a higher perception towards LMS use than male participants.

Compatibility

Female participants had a higher mean in compatibility an *M of*.7993 and a *SD* of .27732 than male participants an *M* of .64310 and a *SD* of .27718. Female participants also had higher perception than male participants.

Trialability

In the third attribute of innovation, which is trialability, male participants had a higher mean with participants not to answer an *M* of .73466 and a *SD* of .28551 than female participants (*M*= .72015, *SD*= .28566) who preferred not to answer.

Ho 1.3. There are no statistically significant differences in faculty response of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, observability) by faculty years of teaching experience.

Result

Pillai's trace test result shows a statistical difference between faculty gender and a respondent's perception of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) The results were V = .088, F (15,852) =1.722, p = .042. In this case, the participants' answers were influenced by how many years each faculty member had been teaching. As result, the null hypothesis Ho 1.3 was rejected. In addition, to determine the significance among dependent variables, an Analysis of Variance (ANOVA) was conducted.

Table 4.15 ANOVA Significance Values of five Attributes of Innovation by Years of Teaching Experiences

		Sum of Squares	df	Mean Square	F	Sig.
Relative Advantage	Between Groups	12.530	3	4.177	8.117	.000
	Within Groups	205.307	399	.515		
	Total	217.837	402			
Compatibility	Between Groups	10.274	3	3.425	6.711	.000
	Within Groups	203.607	399	.510		
	Total	213.881	402			
Complexity	Between Groups	18.955	3	6.318	10.093	.000
	Within Groups	249.776	399	.626		
	Total	268.732	402			
Trialability	Between Groups	1.277	3	.426	.762	.516
	Within Groups	222.967	399	.559		
	Total	224.243	402			
Observability	Between Groups	5.770	3	1.923	4.462	.004
	Within Groups	171.990	399	.431		
	Total	177.761	402			

According to the ANOVA, test four attributes of innovation were found to be statistically significant: relative advantage (p = .000), compatibility (p =.000), complexity (p = .000), and

observability (p =.004). However, trialability (p = .516) was not statistically significant. In order to illustrate the difference among participants, a Tukey post hoc test was conducted.

Table 4.16 Tukey Post Hoc Test for Years of Teaching Experience with Attributes of Innovation

Dependent Variables	(I) Years of Teaching Experience	(J) Years of Teaching Experience	Mean Difference (I-J)	Std. Error	Sig.
Relative Advantage	1 - 3	4 - 10	.29264*	.10829	.036
		11 - 20	.51648*	.10900	.000
		More than 21	.39766*	.10392	.001
	4 - 10	1 - 3	-.29264*	.10829	.036
		11 - 20	.22384	.10120	.122
		More than 21	.10502	.09571	.691
	11 - 20	1 - 3	-.51648*	.10900	.000
		4 - 10	-.22384	.10120	.122
		More than 21	-.11883	.09651	.607
	More than 21	1 - 3	-.39766*	.10392	.001
		4 - 10	-.10502	.09571	.691
		11 - 20	.11883	.09651	.607
Compatibility	1 - 3	4 - 10	.19678	.10784	.263
		11 - 20	.40779*	.10854	.001
		More than 21	.40402*	.10349	.001
	4 - 10	1 - 3	-.19678	.10784	.263
		11 - 20	.21101	.10078	.157
		More than 21	.20724	.09532	.132
	11 - 20	1 - 3	-.40779*	.10854	.001
		4 - 10	-.21101	.10078	.157
		More than 21	-.00377	.09611	1.000
	More than 21	1 - 3	-.40402*	.10349	.001
		4 - 10	-.20724	.09532	.132
		11 - 20	.00377	.09611	1.000
Complexity	1 - 3	4 - 10	.30317	.11945	.056
		11 - 20	.47100*	.12022	.001
		More than 21	.60654*	.11462	.000
	4 - 10	1 - 3	-.30317	.11945	.056
		11 - 20	.16783	.11163	.436

		More than 21	.30336*	.10557	.022
	11 - 20	1 - 3	-.47100*	.12022	.001
		4 - 10	-.16783	.11163	.436
		More than 21	.13554	.10645	.581
	More than 21	1 - 3	-.60654*	.11462	.000
		4 - 10	-.30336*	.10557	.022
		11 - 20	-.13554	.10645	.581
Observability	1 - 3	4 - 10	.20868	.09912	.153
		11 - 20	.31385*	.09976	.010
		More than 21	.31743*	.09511	.005
	4 - 10	1 - 3	-.20868	.09912	.153
		11 - 20	.10517	.09263	.668
		More than 21	.10875	.08760	.601
	11 - 20	1 - 3	-.31385*	.09976	.010
		4 - 10	-.10517	.09263	.668
		More than 21	.00358	.08833	1.000
	More than 21	1 - 3	-.31743*	.09511	.005
		4 - 10	-.10875	.08760	.601
		11 - 20	-.00358	.08833	1.000

*. The mean difference is significant at the 0.05 level.

Relative advantage

There was a statistical difference between users in the group with 1-3 years of teaching experience and the users in the groups of 4 -10, 11–20, and more than 21 years regarding to the relative advantage of the Canvas LMS. When the users in the 1-3 and 4-10 years of teaching experience were compared, there was an *M* of .29264 and a P of .036 for 1-3 years of teaching experience. In addition, When the users in the 1-3 and 11-20 years of teaching experience were compared, there was an *M* of .51648 and a P of .000. Finally, A comparison of the users with the 1-3 years of teaching experience and 20 years or more revealed an *M* of .39766 and a P of .001.

Compatibility

There was a statistical difference between users in the group with 1-3 years of teaching experience and the users in the groups with 11-20 and more than 21 years of experience

regarding the compatibility of the Canvas LMS. When the users in the 1-3 and 11-20 years of teaching experience were compared, there was an *M* of 40779 and a P of .001. A comparison of the users with the 1-3 years of teaching experience and 20 years or more revealed an *M* of .40402 and a P of .001.

Complexity

There was a statistical difference between users with 1-3 years of teaching experience and the users with 11-20 years and more than 21 years when looking at the complexity of the Canvas LMS. When the users in the 1-3 and 11-20 years of teaching experience were compared, there was an *M* of .47100 and a P of .001 for 1-3 years of teaching experience. In addition, When the users in the 1-3 and 20 years of teaching experience or more revealed an *M* of .60654 and a P of .000.

There was a statistical difference between users with 4-10 years of teaching experience and more than 21 years concerning the complexity of Canvas LMS. A comparison of the users with the 4-10 years of teaching experience and 20 years or more revealed an *M* of .30336 and a P of .022.

Observability

There was a statistical difference between users in the group with 1-3 years of teaching experience and the users in the groups of 11-20 and more than 21 years of experience regarding to the observability of Canvas LMS. A comparison of the users with the 1-3 years of teaching experience and 11-20 years of teaching experience were compared, there was an *M* of .31385 and a P of .010. In addition, When the users in the 1-3 and 20 years of teaching experience or more were compared there was an *M* of .31743 and a P of .005.

Ho 1.4. There are no statistically significant differences in faculty responses of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability) by faculty academic ranking.

Result

Pillai's trace test result shows a significant statistical difference between academic ranking and respondent's perception of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability).

Table 4.9 shows statistically significant differences between faculty academic ranking and respondents' perceptions of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability). The results were V = .189, F (25,1430) =2,244, p = .000. In this case, the participants' answers were influenced by faculty academic ranking. As a result, the null hypothesis Ho 1.4 was rejected. In addition, to determine the significance difference among dependent variables Analysis of Variance (ANOVA) was conducted.

Table 4.17 ANOVA Significance Values of five Attributes of Innovation by Academic Ranking

Dependent Variables		Sum of Squares	df	Mean Square	F	Sig.
Relative Advantage	Between Groups	15.567	5	3.113	6.111	.000
	Within Groups	202.270	397	.509		
	Total	217.837	402			
Compatibility	Between Groups	13.251	5	2.650	5.244	.000
	Within Groups	200.630	397	.505		
	Total	213.881	402			
Complexity	Between Groups	26.906	5	5.381	8.834	.000
	Within Groups	241.826	397	.609		
	Total	268.732	402			
Trialability	Between Groups	2.835	5	.567	1.017	.407
	Within Groups	221.408	397	.558		

	Total	224.243	402			
Observability	Between Groups	6.556	5	1.311	3.041	.010
	Within Groups	171.204	397	.431		
	Total	177.761	402			

According to the ANOVA, test four attributes of innovation were found statistically significant: relative advantage (p = .000), compatibility (p =.000), complexity (p = .000), and observability (p =.010). However, trialability (p = .407) was not statistically significant. In order to illustrate the difference among participants, a Tukey post hoc test was conducted

Table 4.18 Tukey Post Hoc Test for Years of Teaching Experience with Attributes of Innovation

Dependent Variable	(I) Academic Rank	(J) Academic Rank	Mean Difference (I-J)	Std. Error	Sig.
Relative Advantage	Professor	Associate Professor	-.03752	.11329	.999
		Assistant Professor	-.25505	.11372	.221
		Lecturer	-.41943*	.14009	.035
		Graduate Teaching Assistant (GTA)	-.51491*	.11554	.000
		Others	-.37577*	.11652	.017
	Associate Professor	Professor	.03752	.11329	.999
		Assistant Professor	-.21752	.11856	.445
		Lecturer	-.38191	.14405	.088
		Graduate Teaching Assistant (GTA)	-.47739*	.12030	.001
		Others	-.33825	.12124	.061
	Assistant Professor	Professor	.25505	.11372	.221
		Associate Professor	.21752	.11856	.445
		Lecturer	-.16439	.14438	.865
		Graduate Teaching Assistant (GTA)	-.25987	.12070	.263
		Others	-.12073	.12164	.920
	Lecturer	Professor	.41943*	.14009	.035
		Associate Professor	.38191	.14405	.088
		Assistant Professor	.16439	.14438	.865
		Graduate Teaching Assistant (GTA)	-.09548	.14582	.987

		Others	.04366	.14659	1.000
	Graduate Teaching Assistant (GTA)	Professor	.51491*	.11554	.000
		Associate Professor	.47739*	.12030	.001
		Assistant Professor	.25987	.12070	.263
		Lecturer	.09548	.14582	.987
		Others	.13914	.12334	.870
	Others	Professor	.37577*	.11652	.017
		Associate Professor	.33825	.12124	.061
		Assistant Professor	.12073	.12164	.920
		Lecturer	-.04366	.14659	1.000
		Graduate Teaching Assistant (GTA)	-.13914	.12334	.870
Compatibility	Professor	Associate Professor	-.08606	.11283	.974
		Assistant Professor	-.41048*	.11326	.004
		Lecturer	-.40524*	.13953	.045
		Graduate Teaching Assistant (GTA)	-.44935*	.11507	.002
		Others	-.32948	.11604	.053
	Associate Professor	Professor	.08606	.11283	.974
		Assistant Professor	-.32442	.11808	.068
		Lecturer	-.31918	.14346	.229
		Graduate Teaching Assistant (GTA)	-.36330*	.11981	.031
		Others	-.24342	.12075	.335
	Assistant Professor	Professor	.41048*	.11326	.004
		Associate Professor	.32442	.11808	.068
		Lecturer	.00525	.14380	1.000
		Graduate Teaching Assistant (GTA)	-.03887	.12021	1.000
		Others	.08100	.12114	.985
	Lecturer	Professor	.40524*	.13953	.045
		Associate Professor	.31918	.14346	.229
		Assistant Professor	-.00525	.14380	1.000
		Graduate Teaching Assistant (GTA)	-.04412	.14523	1.000
		Others	.07576	.14600	.995
	Graduate Teaching Assistant (GTA)	Professor	.44935*	.11507	.002
		Associate Professor	.36330*	.11981	.031

		Assistant Professor	.03887	.12021	1.000
		Lecturer	.04412	.14523	1.000
		Others	.11988	.12284	.925
	Others	Professor	.32948	.11604	.053
		Associate Professor	.24342	.12075	.335
		Assistant Professor	-.08100	.12114	.985
		Lecturer	-.07576	.14600	.995
		Graduate Teaching Assistant (GTA)	-.11988	.12284	.925
Complexity	Professor	Associate Professor	-.25790	.12388	.299
		Assistant Professor	-.60565*	.12435	.000
		Lecturer	-.48170*	.15318	.022
		Graduate Teaching Assistant (GTA)	-.73572*	.12633	.000
		Others	-.49227*	.12740	.002
	Associate Professor	Professor	.25790	.12388	.299
		Assistant Professor	-.34775	.12963	.081
		Lecturer	-.22381	.15750	.714
		Graduate Teaching Assistant (GTA)	-.47782*	.13154	.004
		Others	-.23437	.13257	.488
	Assistant Professor	Professor	.60565*	.12435	.000
		Associate Professor	.34775	.12963	.081
		Lecturer	.12395	.15787	.970
		Graduate Teaching Assistant (GTA)	-.13007	.13198	.922
		Others	.11338	.13300	.957
	Lecturer	Professor	.48170*	.15318	.022
		Associate Professor	.22381	.15750	.714
		Assistant Professor	-.12395	.15787	.970
		Graduate Teaching Assistant (GTA)	-.25401	.15944	.604
		Others	-.01057	.16029	1.000
	Graduate Teaching Assistant (GTA)	Professor	.73572*	.12633	.000
		Associate Professor	.47782*	.13154	.004
		Assistant Professor	.13007	.13198	.922
		Lecturer	.25401	.15944	.604
		Others	.24345	.13486	.464

	Others	Professor	.49227*	.12740	.002
		Associate Professor	.23437	.13257	.488
		Assistant Professor	-.11338	.13300	.957
		Lecturer	.01057	.16029	1.000
		Graduate Teaching Assistant (GTA)	-.24345	.13486	.464
Observability	Professor	Associate Professor	-.04318	.10423	.998
		Assistant Professor	.07735	.10462	.977
		Lecturer	-.20775	.12889	.591
		Graduate Teaching Assistant (GTA)	-.29847	.10630	.058
		Others	-.00536	.10720	1.000
	Associate Professor	Professor	.04318	.10423	.998
		Assistant Professor	.12053	.10907	.879
		Lecturer	-.16457	.13252	.816
		Graduate Teaching Assistant (GTA)	-.25529	.11068	.194
		Others	.03783	.11154	.999
	Assistant Professor	Professor	-.07735	.10462	.977
		Associate Professor	-.12053	.10907	.879
		Lecturer	-.28510	.13283	.266
		Graduate Teaching Assistant (GTA)	-.37582*	.11105	.010
		Others	-.08270	.11191	.977
	Lecturer	Professor	.20775	.12889	.591
		Associate Professor	.16457	.13252	.816
		Assistant Professor	.28510	.13283	.266
		Graduate Teaching Assistant (GTA)	-.09072	.13415	.984
		Others	.20240	.13487	.664
	Graduate Teaching Assistant (GTA)	Professor	.29847	.10630	.058
		Associate Professor	.25529	.11068	.194
		Assistant Professor	.37582*	.11105	.010
		Lecturer	.09072	.13415	.984
		Others	.29311	.11347	.104
	Others	Professor	.00536	.10720	1.000
		Associate Professor	-.03783	.11154	.999
		Assistant Professor	.08270	.11191	.977

	Lecturer	-.20240	.13487	.664
	Graduate Teaching Assistant (GTA)	-.29311	.11347	.104

*. The mean difference is significant at the 0.05 level.

Relative Advantage

There was a difference between users according to their academic rank regarding the relative advantage of the Canvas LMS. The post hoc test result shows that when the lecturer and professor were compared, there was an *M* of .41943 and a P of .035 for lecturer. Also, a comparison of the graduate teaching assistant (GTA) and professor ranks revealed an *M* of .51491 and a P of .000 for GTA. A comparison of the graduate teaching assistant (GTA) and associate professor revealed an *M* of .47739 and a P of .001 for GTA. Finally, when the users who chose others academic rank such as Instructors and professor were compared, there was an *M* of .37577 and a P of .017 for others academic rank.

Compatibility

There was a difference between users according to their academic rank pertaining to the compatibility of the Canvas LMS. The post hoc test result indicated that when the assistant professor and professor were compared, there was an *M* of .41048 and a P of .004 for assistant professor. Another statistical difference revealed when the lecturer and professor were compared, there was an *M* of .40524 and a P of .002 for lecturer. Another statistical difference revealed when the graduate teaching assistant and professor were compared, there was an *M* of .44935 and a P of .002 for graduate teaching assistant. Also, another statistical difference revealed when the graduate teaching assistant and Associate Professor were compared, there was an *M* of .36330 and a P of .031 for graduate teaching assistant. Finally, when the users who chose others

academic rank such as Instructors and professor were compared, there was an *M* of .32948 and a P of .053 for others academic rank.

Complexity

There is a difference between users according to their academic rank with regard to the complexity of the Canvas LMS. The post hoc test result indicated that when the assistant professor and professor were compared, there was an *M* of .60565 and a P of .000 for assistant professor. In addition, when the lecturer and professor were compared, there was an *M* of. 48170 and a P of .022 for lecturer. A comparison of the graduate teaching assistant (GTA) and professor revealed an *M* of .73572 and a P of .000 for GTA. Another comparison of the graduate teaching assistant (GTA) and associate professor revealed an *M* of. 47782 and a P of. 004 for GTA. Finally, when the users who chose others academic rank such as Instructors and professor were compared, there was an *M* of. 49227and a P of. 002for others academic rank.

Observability

There was a statistical difference for graduate teaching assistants an M of 37582 and a *P* = .010 with assistant professor regard to the observability of the Canvas LMS.

Research Question Two

What are the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and their perception of the organizational support related to the adoption of the learning management system?

Test of Null Hypothesis

Ho 2.1. There are no statistically significant differences in faculty response regarding the organizational support related to the adoption of an LMS by faculty age.

Result

An ANOVA test was conducted, and there was a statistical difference among faculty members at Kansas State University in all four independent variables (age, gender, academic ranking, and years of teaching experience) and their perception of the organizational support related to their adoption of the LMS as follows:

Kansas State University

Table 4.19 ANOVA Test for Participants Age with Organizational Support

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.306	4	1.326	3.979	.004
Within Groups	132.670	398	.333		
Total	137.976	402			

According to the ANOVA test, there was a statistical difference among the participants regarding their age a *p* of .004 and their perceptions of organizational support related to LMS use at Kansas State University. Table 4.19 shows statistically significant differences between faculty age and their perception of the organizational support related to the adoption of the learning management system. The results were F (2, 398) = 3.97, and a $p = .004$. In this case, the participants' answers were influenced by their age. As a result, the null hypothesis Ho 2.1 was rejected. To determine the difference among participants, a Tukey post hoc test was conducted.

Table 4.20 Tukey Post Hoc Test for Participants Age and Organizational Support

(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	Sig.
21 - 30	31 - 40	.14996	.09654	.528
	41 -50	.31144*	.10200	.020
	51 - 60	.06698	.10128	.964
	More than 61	.29761*	.10361	.035
31 - 40	21 - 30	-.14996	.09654	.528

	41 -50	.16148	.08453	.314
	51 - 60	-.08298	.08366	.859
	More than 61	.14765	.08646	.430
41 -50	21 - 30	-.31144*	.10200	.020
	31 - 40	-.16148	.08453	.314
	51 - 60	-.24445	.08991	.053
	More than 61	-.01383	.09252	1.000
51 - 60	21 - 30	-.06698	.10128	.964
	31 - 40	.08298	.08366	.859
	41 -50	.24445	.08991	.053
	More than 61	.23063	.09172	.089
More than 61	21 - 30	-.29761*	.10361	.035
	31 - 40	-.14765	.08646	.430
	41 -50	.01383	.09252	1.000
	51 - 60	-.23063	.09172	.089

*. The mean difference is significant at the 0.05 level.

There was a statistical difference between users in the age groups of 21-30 with users in the age of 41-50, and faculty who were more than 61 years old regarding to the organizational support related to LMS use. Table 4.20 shows that users in the 21-30 age group an *M* of .31144 and a *P* of .020 compared with the 41-50 age group and an *M* of.29761 and a *P* of .035 groups age more than 61. The result of this table indicated that younger faculty members between the ages of 21-30 are more likely to use organizational support to adopt technology such as an LMS.

Figure 4.5 The Mean of Organizational Support by Respondent's Age

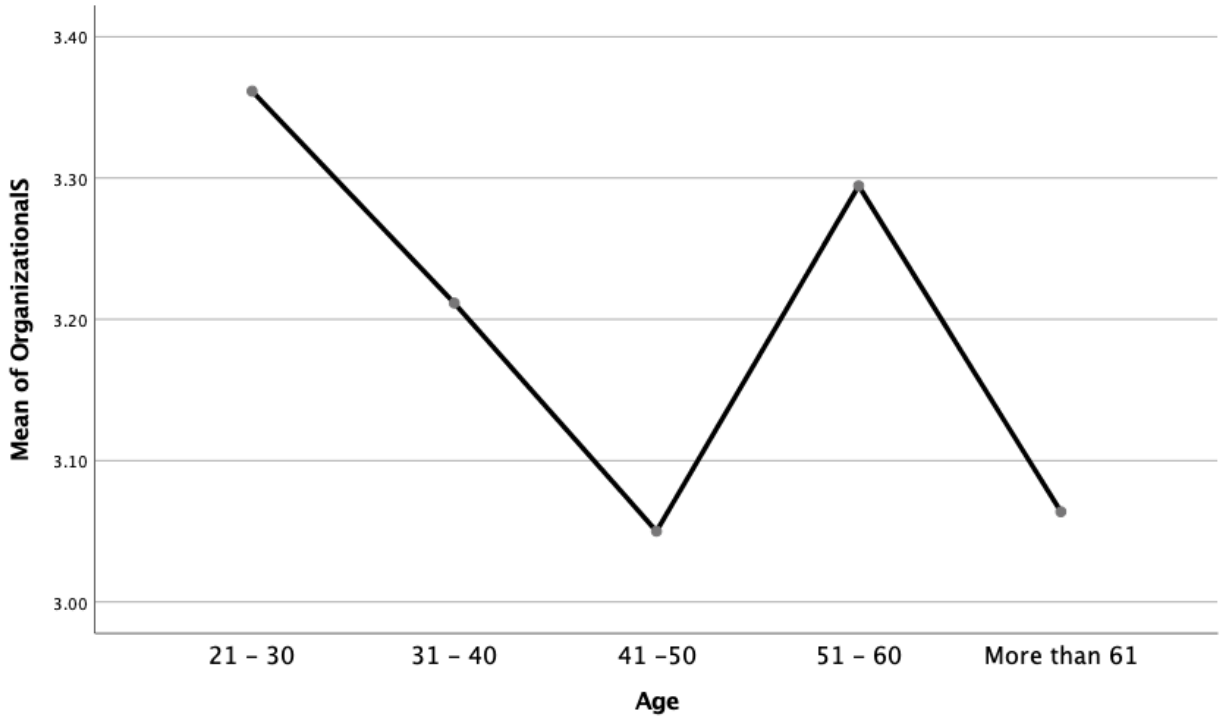


Table 4.21 ANOVA Test for Participants Gender and Organizational Support

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.488	2	2.744	8.285	.000
Within Groups	132.488	400	.331		
Total	137.976	402			

According to the ANOVA test, there was a statistical difference among the participants with regard to their gender a *p* of .000 and their perceptions of organizational support related to LMS use at Kansas State University. Table 4.21 shows statistically significant differences between faculty gender and their perception of the organizational support related to the adoption of the learning management system. The results were F (2, 400) = 8.28, and a *p* = .000. In this case, the participants' answers were influenced by their gender. As a result, the null hypothesis Ho 2.2 was rejected. In order to illustrate the difference among participants, a Tukey post hoc test was conducted.

Table 4.22 Tukey Post Hoc Test for Participants Gender with Organizational Support

(I) Gender	(J) Gender	Mean Difference (I-J)	Std. Error	Sig.
Prefer not to answer	Male	-.45193	.22128	.104
	Female	-.63871*	.22139	.011
Male	Prefer not to answer	.45193	.22128	.104
	Female	-.18679*	.05785	.004
Female	Prefer not to answer	.63871*	.22139	.011
	Male	.18679*	.05785	.004

*. The mean difference is significant at the 0.05 level.

A Tukey post hoc test revealed that there was a statistical difference between female and male participants; females had a higher mean on organizational support (M= .18679, SD= .05785) for an LMS than male participants.

Figure 4.6 The Mean of Organizational Support by Respondent's Gender

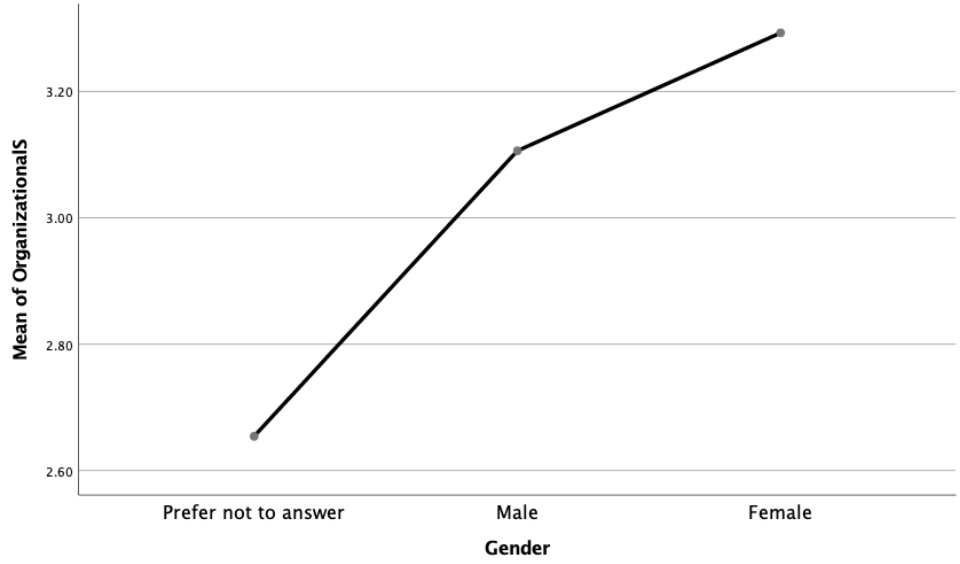


Table 4.23 ANOVA Test of Organizational Support and Years of Teaching Experience

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.730	3	1.243	3.696	.012
Within Groups	134.245	399	.336		

Total	137.976	402

According to the ANOVA test, there was a statistical difference among the participants regarding their years of teaching experience (p = .012) and their perceptions of organizational support related to LMS use at Kansas State University. Table 4.23 shows statistically significant differences between faculty years of teaching experience and their perception of the organizational support related to the adoption of the learning management system. The results were F (2, 398) = 3.97, and a p = .004. In this case, the participants' answers were influenced by their years of teaching experience. As a result, the null hypothesis Ho 2.3 was rejected. In order to illustrate the difference among participants, a Tukey post hoc test was conducted.

Table 4.24 Tukey Post Hoc Test for Participants Years of Teaching Experience with Organizational Support

(I) Years of Teaching Experience	(J) Years of Teaching Experience	Mean Difference (I-J)	Std. Error	Sig.
1 - 3	4 - 10	.22300	.08757	.055
	11 - 20	.27505*	.08814	.010
	More than 21	.22183*	.08403	.043
4 - 10	1 - 3	-.22300	.08757	.055
	11 - 20	.05206	.08184	.920
	More than 21	-.00117	.07740	1.000
11 - 20	1 - 3	-.27505*	.08814	.010
	4 - 10	-.05206	.08184	.920
	More than 21	-.05322	.07804	.904
More than 21	1 - 3	-.22183*	.08403	.043
	4 - 10	.00117	.07740	1.000
	11 - 20	.05322	.07804	.904

*. The mean difference is significant at the 0.05 level.

There was a statistical difference between users in the group of 1-3 years of teaching experience and users in the groups with 11-20 and more than 21 years of experience with regard to organizational support related to LMS use. The results were an M of.27505 and a P of .010

with group users 1-20 years and an M of 22183 and a *P* of .043 with more than 21 years of teaching experience. Table 4.24 shows that new faculty members at Kansas State university with 1-3 and 4-10 years of teaching experience are more likely to use university support to adopt technology such as an LMS.

Figure 4.7 The Mean of Organizational Support by Respondent's Years of Teaching Experience

Table 4.25 ANOVA Significance Values of Organizational Support by Academic Rank

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.307	5	1.061	3.176	.008
Within Groups	132.669	397	.334		
Total	137.976	402			

Table 4.25 shows statistically significant differences between faculty academic rank and their perception of the organizational support related to the adoption of the learning management system. The results were F (5, 397) = 3.17, and a p = .008. In this case, the participants' answers were influenced by their academic rank. As a result, the null hypothesis Ho 2.4 was rejected. A Tukey post hoc test was conducted to illustrate the difference among participants by their academic rank.

Table 4.26 Tukey Post Hoc Test for Participants Academic Rank with Organizational Support

(I) Academic Rank	(J) Academic Rank	Mean Difference (I-J)	Std. Error	Sig.
Professor	Associate Professor	.00502	.09175	1.000
	Assistant Professor	-.15450	.09210	.548
	Lecturer	-.22684	.11346	.344
	Graduate Teaching Assistant (GTA)	-.29786*	.09357	.019
	Others	-.18512	.09436	.366
Associate Professor	Professor	-.00502	.09175	1.000
	Assistant Professor	-.15952	.09602	.558
	Lecturer	-.23187	.11666	.351
	Graduate Teaching Assistant (GTA)	-.30289*	.09743	.024
	Others	-.19014	.09819	.381
Assistant Professor	Professor	.15450	.09210	.548
	Associate Professor	.15952	.09602	.558
	Lecturer	-.07235	.11693	.990
	Graduate Teaching Assistant (GTA)	-.14337	.09775	.686
	Others	-.03062	.09851	1.000
Lecturer	Professor	.22684	.11346	.344
	Associate Professor	.23187	.11666	.351
	Assistant Professor	.07235	.11693	.990
	Graduate Teaching Assistant (GTA)	-.07102	.11809	.991
	Others	.04173	.11872	.999
Graduate Teaching Assistant (GTA)	Professor	.29786*	.09357	.019
	Associate Professor	.30289*	.09743	.024
	Assistant Professor	.14337	.09775	.686
	Lecturer	.07102	.11809	.991
	Others	.11275	.09989	.869
Others	Professor	.18512	.09436	.366
	Associate Professor	.19014	.09819	.381
	Assistant Professor	.03062	.09851	1.000
	Lecturer	-.04173	.11872	.999

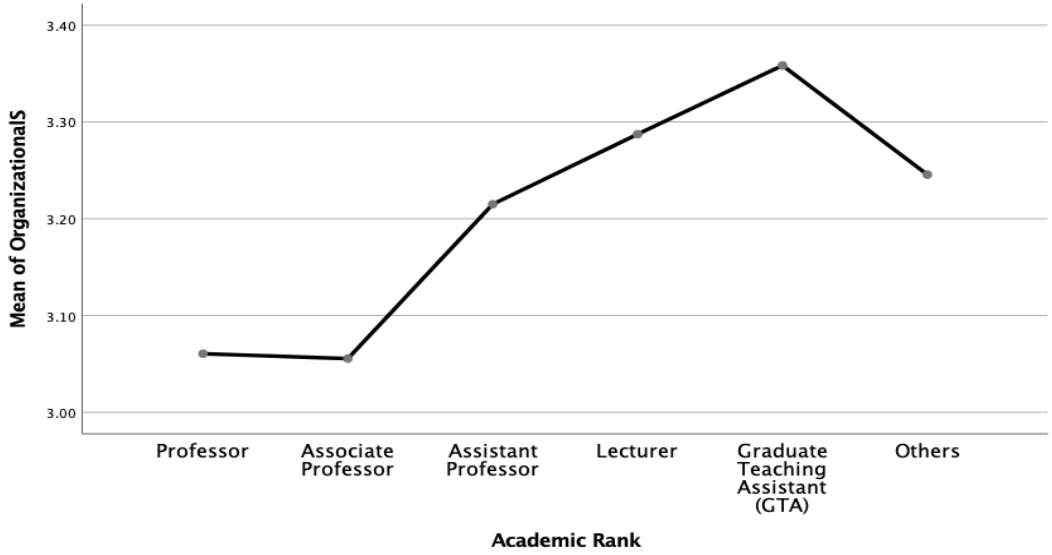
	Graduate Teaching Assistant (GTA)	-.11275	.09989	.869

*. The mean difference is significant at the 0.05 level.

There was a statistical difference between users according to their academic rank and their response to organizational support related to the Canvas LMS. The post hoc test result in Table 4.26 shows that graduate teaching assistants an M of .29786 and a P of .019 compared with professors. Also, GTA an M of 30289 and a P of .024 and with associate professor. graduate teaching assistants shows a higher mean than all other academic ranks at Kansas State University.

The result indicates that younger faculty members such as GTAs are more likely to use university support to adopt technology such as an LMS. GTAs showed positive perspectives toward the university effort to make the Canvas LMS usable for faculty members.

Figure 4.8 The Mean of Organizational Support by Respondents Academic Rank



An ANOVA test was conducted, and there was no a statistical difference among faculty members at King Saud University in all four independent variables (age, gender, academic

ranking, and years of teaching experience) and their perception of the organizational support related to their adoption of the LMS as follows.

King Saud University

Table 4.27 ANOVA Significance Values of Organizational Support by Age.

Age	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.295	4	.574	.761	.553
Within Groups	74.683	99	.754		
Total	76.978	103			

Table 4.27 shows no statistically significant differences between faculty age and their perception of the organizational support related to the adoption of the learning management system. The result was F (4, 99) = .761, and a p = .553. In this case, the participants' answers were not influenced by their age. As a result, the null hypothesis Ho 2.1 was accepted.

Table 4.28 ANOVA Significance Values of Organizational Support by Gender.

Gender	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.495	2	1.748	2.402	.096
Within Groups	73.482	101	.728		
Total	76.978	103			

Table 4.28 shows no statistically significant differences between faculty gender and their perception of the organizational support related to the adoption of the learning management system. The result was F (2, 101) = 2.40, and a p = .096. In this case, the participants' answers were not influenced by their gender. As a result, the null hypothesis Ho 2.2 was accepted.

Table 4.29 ANOVA Significance Values of Organizational Support by Years Of Teaching Experiences.

Years of Teaching Experiences	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.037	3	.679	.906	.441
Within Groups	74.941	100	.749		
Total	76.978	103			

Table 4.29 shows statistically significant differences between faculty years of teaching experiences and their perception of the organizational support related to the adoption of the learning management system. The result was F (3, 100) = .906, and a p = .441. In this case, the participants' answers were not influenced by their years of teaching experiences. As a result, the null hypothesis Ho 2.3 was accepted.

Table 4.30 ANOVA Significance Values of Organizational Support by Academic Rank.

Academic Rank	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.792	4	.198	.257	.905
Within Groups	76.185	99	.770		
Total	76.978	103			

Table 4.30 shows statistically significant differences between faculty academic rank and their perception of the organizational support related to the adoption of the learning management

system. The result was F (4, 99) = .257, and a p = .905. In this case, the participants' answers were not influenced by their academic rank. As a result, the null hypothesis Ho 2.4 was accepted.

Research Question Three

What are the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and the two factors that might impact the adoption of the LMS (time concern and fear of change of technology)?

Kansas State University

Table 4.31 Pillai's Trace Test result of MANOVA on Time concern and Fear of Change of Technology

Effect		Value	F	Hypothesis df	Error df	Sig.
Age	Pillai's Trace	.033	1.195	8.000	572.000	.299
Gender	Pillai's Trace	.011	.765	4.000	572.000	.548
Years of Teaching Experiences	Pillai's Trace	.008	.377	6.000	572.000	.894
Academic Rank	Pillai's Trace	.072	2.132	10.000	572.000	.021

Test of Null Hypothesis

Ho 3.1. There are no statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty age.

Table 4.31 shows no statistically significant difference between faculty age at Kansas State University and time concern and fear of change V = .033, *F* 8, 572 = 1.195 *p* = .299. In this case, the participants' answers were not influenced by their age. As a result, the null hypothesis Ho 3.1 was accepted.

Ho 3.2. There are no statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty gender.

Table 4.31 shows no statistically significant difference between faculty gender at Kansas State University and time concern and fear of change V = .011, *F* 4, 572 = .765 *p* = .548. In this case, the participants' answers were not influenced by their gender. As a result, the null hypothesis Ho 3.2 was accepted.

Ho 3.3. There are no statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty years of teaching experiences.

Table 4.31 shows no statistically significant difference between faculty years of teaching experiences at Kansas State University and time concern and fear of change V = .008, *F* 6, 572 = .377*p* = .894. In this case, the participants' answers were not influenced by their years of teaching experiences. As a result, the null hypothesis Ho 3.3 was accepted.

Ho 3.4. There are statistically significant differences in faculty response regarding the (time concern, fear of change of new technology) related to the adoption of an LMS by faculty academic rank.

Pillai's trace test result shows a statistical difference between faculty academic rank and time concern and fear of change of technology at Kansas State University.

Table 4.31 shows a statistically significant difference between faculty academic rank at Kansas state University and time concern and fear of change V = .072, F 10, 570 = 2.132 p = .021. In this case, the participants' answers were influenced by their academic rank. As a result, the null hypothesis Ho 3.4 was rejected. To determine the significant difference among dependent variables, an Analysis of Variance (ANOVA) test was conducted.

Table 4.32 ANOVA Significance Values of Fear of Change by Academic Rank

		Sum of Squares	df	Mean Square	F	Sig.
Fear of change	Between Groups	5.823	5	1.165	4.694	.000
	Within Groups	98.496	397	.248		
	Total	104.319	402			

The ANOVA test shows that there was a statistical difference among participants with respect to their academic rank (p = .000) and fear of change of technology related to LMS use at Kansas State University. The Tukey post hoc test was conducted to illustrate the difference among participants by their academic rank.

Table 4.33 Tukey Post Hoc Test for Faculty Academic Rank with Fear of Change

(I) Academic Rank	(J) Academic Rank	Mean Difference (I-J)	Std. Error	Sig.
Professor	Associate Professor	-.03351	.07906	.998
	Assistant Professor	.16360	.07936	.310
	Lecturer	.26120	.09776	.083
	Graduate Teaching Assistant (GTA)	-.10176	.08062	.805
	Others	.17168	.08131	.283
Associate Professor	Professor	.03351	.07906	.998
	Assistant Professor	.19711	.08273	.165
	Lecturer	.29471*	.10052	.041
	Graduate Teaching Assistant (GTA)	-.06825	.08395	.965
	Others	.20519	.08460	.150

Assistant Professor	Professor	-.16360	.07936	.310
	Associate Professor	-.19711	.08273	.165
	Lecturer	.09760	.10075	.928
	Graduate Teaching Assistant (GTA)	-.26536*	.08423	.022
	Others	.00808	.08488	1.000
Lecturer	Professor	-.26120	.09776	.083
	Associate Professor	-.29471*	.10052	.041
	Assistant Professor	-.09760	.10075	.928
	Graduate Teaching Assistant (GTA)	-.36296*	.10175	.005
	Others	-.08952	.10230	.952
Graduate Teaching Assistant (GTA)	Professor	.10176	.08062	.805
	Associate Professor	.06825	.08395	.965
	Assistant Professor	.26536*	.08423	.022
	Lecturer	.36296*	.10175	.005
	Others	.27344*	.08607	.020
Others	Professor	-.17168	.08131	.283
	Associate Professor	-.20519	.08460	.150
	Assistant Professor	-.00808	.08488	1.000
	Lecturer	.08952	.10230	.952
	Graduate Teaching Assistant (GTA)	-.27344*	.08607	.020

*. The mean difference is significant at the 0.05 level.

There was a statistical difference between users according to their academic rank and their response to the fear of change of technology. The post hoc test result in table 4.33 shows that associate professor had an M of .29741 and a P of .041 compared with lecturer. Another difference was between graduate teaching assistants an M of 26536 and a P of .022 compared with assistant professor. In addition, there was a difference when compared GTA an M of 36296 and a P of .005 with lecturer. Also, there was a difference between GTA had an M of 27344 and a P of .020 with others such as instructors. Finally, associate professor showed higher mean only

with lecturer. In contrast, graduate teaching assistant showed a higher mean than all other academic ranks at Kansas State University.

King Saud University

Table 4.34 Pillai's Trace Test result of MANOVA on Time concern and Fear of Change of Technology

Effect		Value	F	Hypothesis df	Error df	Sig.
Age	Pillai's Trace	.093	.734	8.000	120.000	.661
Gender	Pillai's Trace	.108	1.705	4.000	120.000	.153
Years of Teaching Experiences	Pillai's Trace	.032	.328	6.000	120.000	.921
Academic Rank	Pillai's Trace	.121	.969	8.000	120.000	.463

Pillai's trace test result shows no statistical difference for faculty members at King Saud University concerning all independent variables (age, gender, academic ranking, and years of teaching experience)

Table 4.34 shows no a statistically significant difference between faculty age at King Saud University and time concern and fear of change V = .093, F 8, 120 = .734 p = .661. In this case, the participants' answers were not influenced by their age. As a result, the null hypothesis Ho 3.1 was accepted. In addition, there was no a statistically significant difference between faculty gender at King Saud University and time concern and fear of change V = .108, F 4, 120 = 1.705 p = .153. In this case, the participants' answers were not influenced by their gender. As a result, the null hypothesis Ho 3.2 was accepted. Also, there was no a statistically significant difference between faculty years of teaching experiences at King Saud University and time concern and fear of change V = .032, F 8, 120 = .328 p = .921. In this case, the participants'

answers were not influenced by their years of teaching experiences. As a result, the null hypothesis Ho 3.3 was accepted. Finally, there was no a statistically significant difference between faculty academic rank at King Saud University and time concern and fear of change V = .121, F 6, 120 = .969 p = .463. In this case, the participants' answers were not influenced by their academic rank. As a result, the null hypothesis Ho 3.4 was accepted.

Chapter 5 - Conclusions and Discussion, and Recommendations

Chapter Overview

The study investigated the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experiences) and their adoption of the learning management system (LMS) at Kansas State University and compares that with faculty members at King Saud University in Saudi Arabia. The findings will help university leaders and decision makers in adopting technology such as an LMS in the higher education setting. It is important to take into consideration the faculty personal characteristics as factors that might reduce the benefits of a learning tool. Moreover, it is important to recognize that organizational support from a university is a fundamental component to meet faculty members' needs to ensure effective use of technology in the student learning process.

There were three research questions:

1) What is the relationship between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and Rogers's five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability)?
2) What is the relationship between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and their perception of the organizational support related to the adoption of the learning management system?
3) What is the relationship between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and time concern and fear of change of new technology related to the adoption of the learning management system use?

This chapter presented a summary of the study, discussion of each research question, and overall conclusions from the study. Furthermore, this chapter includes recommendations for Kansas State University as well as King Saud University and the future research.

Rogers Five Attributes of Innovation

Relative advantage

Relative advantage is “the degree to which an innovation is perceived as being better than the idea it supersedes” (Rogers, 2003, p. 229). The survey participants showed a high level of preference toward an LMS. More than half of the participants at Kansas State University agreed or strongly agreed that an LMS improved their quality of teaching, made their work easier, allowed them to manage their courses, and gave other advantages listed in the survey items. From fifteen items related to the relative advantages of an LMS in the survey, only three items were not agreed with by the participants: "helps me plan and improve student teaching”, “allows my students to develop greater technological skills”, “and allows meaningful student learning”. On the other hand, 10% to 25% of the participants either disagreed or strongly disagreed with the relative advantages of an LMS.

Table 5.1 Descriptive Statistics of Relative advantages for KSU Participants

Relative advantages	Disagree and Strongly Disagree	Agree and Strongly Agree
1. Using K-State Online (Canvas) enables me to significantly improve the overall quality of my teaching	11.41%	62.03%
2. Using K-State Online (Canvas) makes it easier to do my job.	10.42%	79.16%
3. Using K-State Online (Canvas) enables me to accomplish course management tasks (management course content, assignments, and resources) more efficiently.	8.19%	81.39%
4. Using K-State Online (Canvas) an efficient use of my time and increases my productivity	13.15%	67.49%

5. K-State Online (Canvas) allows me greater flexibility and control over my work.	14.39%	57.57%
6. K-State Online (Canvas) allows me to reach wider audiences	18.61%	48.14%
7. K-State Online (Canvas) allows me to develop new technological skills.	21.34%	51.61%
8. Using K-State Online (Canvas) enables me to use technology more innovatively in my teaching.	19.60%	50.12%
9. Using K-State Online (Canvas) helps me plan and improve student teaching.	18.11%	40.45%
10. K-State Online (Canvas) allows my students to develop greater technological skills.	23.82%	38.96%
11. K-State Online (Canvas) allows for deeper or more meaningful student learning.	29.03%	29.53%
12. Using K-State Online (Canvas) increases student access to class information.	4.47%	89.58%
13. Using K-State Online (Canvas) encourages student engagement with course content.	15.88%	57.82%
14. Using K-State Online (Canvas) increase interaction between students and instructor.	28.29%	41.44%
15. The benefits of using K-State Online (Canvas) outweigh the hassle factor (related to time and effort required to learn/use the LMS and the potential for frequent frustrations).	14.89%	68.24%

King Saud University

Approximately half of the participants believed that using an LMS was a helpful learning tool that would improve their quality of teaching, make their work easier, allow them to manage their courses and provided other advantages listed in the survey items. On the other hand, more than 40% of the participants did not believe that LMS advantages would improve their work.

Table 5.2 Descriptive Statistics of Relative advantages for King Saud University Participants

Relative advantages	Disagree and Strongly Disagree	Agree and Strongly Agree
1. Using (Blackboard) enables me to significantly improve the overall quality of my teaching	48.08%	46.15%
2. Using (Blackboard) makes it easier to do my job.	49.04%	48.08%
3. Using (Blackboard) enables me to accomplish course management tasks (management course content, assignments, and resources) more efficiently.	46.15%	46.15%
4. Using (Blackboard) an efficient use of my time and increases my productivity	44.23%	43.27%
5. Blackboard allows (would allow) me greater flexibility and control over my work.	42.31%	40.38%
6. Blackboard allows (would allow) me to reach wider audiences	41.35%	40.38%
7. Blackboard allows me to develop new technological skills.	45.19%	43.27%
8. Using (Blackboard) enables me to use technology more innovatively in my teaching.	39.42%	42.31%
9. Using (Blackboard) helps me plan and improve student teaching.	44.23%	39.42%
10. Blackboard allows my students to develop greater technological skills.	38.46%	42.31%
11. Blackboard allows for deeper or more meaningful student learning.	37.50%	34.62%
12. Using (Blackboard) increases student access to class information.	46.15%	43.27%
13. Using (Blackboard) encourages student engagement with course content.	47.12%	37.50%
14. Using (Blackboard) increase interaction between students and instructor.	43.27%	42.31%
15. The benefits of using (Blackboard) outweigh the hassle factor (related to time and effort required to learn/use the LMS and the potential for frequent frustrations).	42.31%	43.27%

Compatibility

Compatibility is defined as "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (Rogers, 2003, p. 240). An LMS as an innovation should meet the needs of the faculty members to be considered compatible. More than 60% of the faculty members at Kansas State University agreed or strongly agreed that an LMS as a learning tool was compatible with their teaching approach. Only two items were rated unfavorably with regards to the compatibility of an LMS.

Table 5.3 Descriptive Statistics of Compatibility for KSU Participants

Compatibility	Disagree and Strongly Disagree	Agree and Strongly Agree
1. Using K-State Online (Canvas) fits well with my teaching style.	16.13%	65.51%
2. Using K-State Online (Canvas) support my philosophy of teaching.	16.87%	53.85%
3. Using K-State Online (Canvas) is compatible with my students' needs.	6.20%	76.92%
4. Using K-State Online (Canvas) is compatible with the resources I am currently using in my course(s).	10.92%	79.40%
5. I feel (would feel) comfortable using K-State Online (Canvas).	7.44%	83.87%
6. Using K-State Online (Canvas) compatible with most aspects of my teaching.	13.15%	72.70%
7. Using K-State Online (Canvas) for academic purposes is compatible with all religious and cultural aspects of my work.	7.69%	49.38%
8. Courses utilizing online technologies such as K-State Online (Canvas) are equal or superior in quality to these that do not.	19.85%	41.69%
9. The lack of direct interpersonal contact and feedback from students' does (would) not present a problem.	37.47%	33.00%
10. K-State Online (Canvas) is compatible with my level of technology expertise and experience.	7.44%	82.38%

King Saud University

Almost half of the participants at King Saud University agreed or strongly agreed that the LMS features were compatible with their teaching. In contrast, 33% to 45 % of the faculty members surveyed did not believe that Blackboard LMS features were compatible with their teaching approaches.

Table 5.4 Descriptive Statistics of Compatibility for King Saud University Participants

Compatibility	Disagree and Strongly Disagree	Agree and Strongly Agree
1. Using (Blackboard) fits well with my teaching style.	45.19%	43.27%
2. Using (Blackboard) support my philosophy of teaching.	41.35%	40.38%
3. Using (Blackboard) is compatible with my students' needs.	40.38%	41.35%
4. Using (Blackboard) is compatible with the resources I am currently using in my course(s).	40.38%	44.23%
5. I feel comfortable using Blackboard	44.23%	45.19%
6. Using (Blackboard) compatible with most aspects of my teaching.	38.46%	43.27%
7. Using (Blackboard) for academic purposes is compatible with all religious and cultural aspects of my work.	35.58%	40.38%
8. Courses utilizing online technologies such as (Blackboard) are equal or superior in quality to these that do not.	33.65%	39.42%
9. The lack of direct interpersonal contact and feedback from students' does (would) not present a problem.	34.62%	44.23%
10. Blackboard is compatible with my level of technology expertise and experience.	41.35%	46.15%

Complexity

According to Rogers (2003), complexity is "the degree to which an innovation is perceived as relatively difficult to understand and use" (p. 257). It is very important that an LMS

is perceived as user friendly for it to be adopted and utilized. Innovations are variable in their degree of complexity – some of them are difficult to approach and master, while others are clear.

The survey participants showed a high level of preference toward an LMS. More than half of the participants at Kansas State University agreed or strongly agreed that using the Canvas LMS was not complicated and was an easy system to use for educational purposes. Only 21% of the participants faced difficulty and challenges with regard to Canvas and that was mostly related to remembering how to perform tasks in Canvas, and 10-18% of the participants reported difficulty in learning an LMS.

Table 5.5 Descriptive Statistics of Complexity for KSU Participants

Complexity	Disagree and Strongly Disagree	Agree and Strongly Agree
1. Learning to use K-State Online (Canvas) is easy for me.	14.89%	70.72%
2. I find it simple to manage my course and student data using K-State Online (Canvas).	14.14%	73.95%
3. I can easily integrate K-State Online (Canvas) into my courses.	10.67%	76.18%
4. I do not find it difficult to add content to K-State Online (Canvas).	9.93%	79.65%
5. I find (would find) it easy to modify K-State Online (Canvas) course design.	19.11%	59.06%
6. I find it easy to grade using K-State Online (Canvas).	13.40%	71.96%
7. I am able to use the communication tools quickly and easily.	11.66%	70.97%
8. I am able to easily use the test/survey features in K-State Online (Canvas).	17.12%	51.12%
9. I am able to easily utilize the group collaboration functions in K-State Online (Canvas).	18.36%	39.45%
10. It is easy for me to remember how to perform tasks in K-State Online (Canvas).	21.09%	60.05%

King Saud University

Similar numbers of respondents held favorable and unfavorable attitudes towards an LMS. The number of participants who agreed or strongly agreed and the number of participants who disagreed or strongly disagreed about the LMS's ease of use were both around 40%. On the other hand, about 40% of the participants faced difficulty and challenges with Blackboard LMS. Specifically, 46% of the participants faced problems when using Blackboard for grading.

Table 5.6 Descriptive Statistics of Complexity for King Saud University Participants

Complexity	Disagree and Strongly Disagree	Agree and Strongly Agree
1. Learning to use (Blackboard) is easy for me.	41.35%	46.15%
2. I find it simple to manage my course and student data using (Blackboard).	41.35%	46.15%
3. I can easily integrate (Blackboard) into my courses.	41.35%	43.27%
4. I do not find it difficult to add content to (Blackboard).	42.31%	46.15%
5. I find it easy to modify (Blackboard) course design.	38.46%	41.35%
6. I find it easy to grade using (Blackboard).	46.15%	37.50%
7. I am able to use the communication tools quickly and easily.	44.23%	39.42%
8. I am able to easily use the test/survey features in (Blackboard).	39.42%	31.73%
9. I am able to easily utilize the group collaboration functions in (Blackboard).	33.65%	34.62%
10. It is easy for me to remember how to perform tasks in (Blackboard).	42.31%	40.38%

Trialability

Trialability is defined as "the degree to which an innovation may be experimented with on a limited basis" (Rogers, 2003, p. 258). In the case of the adoption of an LMS, a university may need to introduce the new system in stages or parts to allow instructors to use each part and

develop personal experience, which would increase their understanding of how the LMS works. If users receive an innovation such as an LMS in one system that cannot be divided, it is likely to be rejected by users according to Rogers. Forty to sixty percent of the survey participants at Kansas State University were able to try Canvas LMS features before they used it in their classes.

Table 5.7 Descriptive Statistics of Trialability for KSU Participants

Trialability	Disagree and Strongly Disagree	Agree and Strongly Agree
1. I was (am) permitted to use K-State Online (Canvas) on a trial basis long enough to see what it could/can do.	24.81%	39.45%
2. A site is available to me to try out various tools and components of K-State Online (Canvas) before using them in my courses.	21.59%	33.75%
3. Before deciding whether to use any of K-State Online (Canvas) tools/features. I am able to experiment with their use.	20.84%	40.94%
4. I can try out individual features of K-State Online (Canvas) at my own pace.	13.15%	61.04%
5. I am aware of opportunities to try out various uses of K-State Online (Canvas).	32.01%	41.44%
6. Being able to try out features of K-State Online (Canvas) is important to me.	13.40%	63.03%

King Saud University

Almost 50% of the survey participants at King Saud University were not allowed to try Blackboard LMS features to understand what the system could do for them. Moreover, the participants either disagreed or strongly disagreed that they had had a chance to experiment with

the learning system before using it in their courses. However, 46% of the participants believed that being able to try out features of an LMS was important to them.

Table 5.8 Descriptive Statistics of Trialability for King Saud University Participants

Trialability	Disagree and Strongly Disagree	Agree and Strongly Agree
1. I was (am) permitted to use (Blackboard) on a trial basis long enough to see what it could/can do.	49.04%	32.69%
2. A site is available to me to try out various tools and components of (Blackboard) before using them in my courses.	42.31%	30.77%
3. Before deciding whether to use any of (Blackboard) tools/features. I am able to experiment with their use.	37.50%	32.69%
4. I can try out individual features of K-State Online (Blackboard) at my own pace.	33.65%	43.27%
5. I am aware of opportunities to try out various uses of (Blackboard).	36.54%	43.27%
6. Being able to try out features of (Blackboard) is important to me.	41.35%	46.15%

Observability

Observability, according to Rogers (2003), is defined as "the degree to which the results of an innovation are visible to others" (p. 258). Observability depends on the nature of the innovation; some innovations may not be easily observed. For example, educational software is observable but in a different way than hardware components, which can be recognized visually. Individuals tend to adopt innovations that are easily observed (p. 259)

More than half of the participants at Kansas State University agreed or strongly agreed that they observed others using Canvas LMS, the results of using Canvas were apparent to them,

and they were able to explain why using Canvas LMS may or may not be beneficial. Only 31% of the participants were not able to observe how other teachers were using Canvas LMS.

Table 5.9 Descriptive Statistics of Observability for KSU Participants

Observability	Disagree and Strongly Disagree	Agree and Strongly Agree
1. I have observed how other teachers are using K-State Online (Canvas) in their teaching.	31.27%	54.34%
2. Many of my colleagues use K-State Online (Canvas).	0.99%	86.85%
3. I have seen or heard about students using K-State Online (Canvas) for another instructor's course.	5.21%	83.62%
4. The results of using K-State Online (Canvas) are apparent to me.	9.18%	65.51%
5. I would be able to explain why using K-State Online (Canvas) may or may not be beneficial.	3.23%	81.89%

King Saud University

Only 40% to 45% of the participants at King Saud University agreed or strongly agreed that they observed colleagues using Blackboard LMS, the results of using Blackboard are apparent to them, and they were able to explain why using Blackboard may or may not be beneficial. On the other hand, 47% of the participants were not able to observe how other teachers were using Blackboard LMS.

Table 5.10 Descriptive Statistics of Observability for King Saud University Participants

Observability	Disagree and Strongly Disagree	Agree and Strongly Agree
1. I have observed how other teachers are using (Blackboard) in their teaching.	47.12%	34.62%
2. Many of my colleagues use (Blackboard).	36.54%	42.31%

3. I have seen or heard about students using (Blackboard) for another instructor's course.	41.35%	40.38%
4. The results of using (Blackboard) are apparent to me.	37.50%	45.19%
5. I would be able to explain why using (Blackboard) may or may not be beneficial.	41.35%	43.27%

Organizational Support

Organizational support refers to the support that the university provides with regard to different aspects of adopting technology in education, including training development programs, funds, and the availability of technology tools for learning purposes. It also includes the provision of a technical support team to ensure a successful technology integration process (Kelly, 2005).

More than 50% of the survey participants at Kansas State University agreed or strongly agreed that their institution is supporting the LMS system, using the LMS fit to the university vision, and providing professional development. Respondents agreed that their supervisor supported and encouraged the use of the LMS, the faculty believed it was important to consider what their students thought, and participants were generally satisfied with resolutions to problems that occurred while using the LMS. Only 40% to 45% of the participants either disagreed or strongly disagreed that using an LMS would help them to receive rewards, more prestige, or improve their image within their departments. In addition, 47% of the participants believe they were not included in the dialogue about technology and distance education initiatives.

Table 5.11 Descriptive Statistics of Organizational Support for KSU Participants

Organizational Support Related to the LMS Adoption	Disagree and Strongly Disagree	Agree and Strongly Agree

1. Using K-State Online (Canvas) fit into my institution's vision, mission, and goals.	4.71%	69.98%
2. My institution provides the technical infrastructure to support using K-State Online (Canvas) in my courses.	7.44%	79.40%
3. I am adequately rewarded/compensated for incorporating K-State Online (Canvas) in my teaching practices.	40.94%	18.11%
4. Using K-State Online (Canvas) enhances my ability to achieve tenure and promotion.	38.71%	13.15%
5. Technological skills/using K-State Online (Canvas) are important when making hiring/tenure decisions.	39.45%	23.33%
6. My institution has communication its strategic plan for the implementation of K-State Online (Canvas) in teaching practices.	32.51%	23.08%
7. I feel included in the dialogue about technology and distances education initiatives.	47.89%	22.08%
8. The procedure for establishing course web sites using K-State Online (Canvas) encourages faculty use of the system.	18.36%	43.92%
9. I am generally satisfied with the responses or resolution to problem(s) with K-State Online (Canvas).	10.92%	57.07%
10. My institution provides professional development activities to help faculty learn and use K-State Online (Canvas).	6.95%	65.26%
11. Professional development activities related to K-State Online (Canvas) have been effective.	12.41%	35.98%
12. The goals and objectives regarding use of K-State Online (Canvas) are shared by faculty as well as administration.	22.08%	30.52%
13. My supervisor supports/encourages the use of K-State Online (Canvas).	7.69%	58.31%
14. My colleagues think that I should use K-State Online (Canvas) for my course work.	7.20%	49.88%
15. People in my institution who use K-State Online (Canvas) have more prestige than those who do not.	48.14%	8.19%
16. Using K-State Online (Canvas) improve my image within my department or the institution.	40.94%	14.14%
17. Innovativeness and experimentation are encouraged at my institution	7.20%	67.74%

18. In terms of using K-State Online (Canvas), it is important to me to consider what my peers think.	45.41%	20.35%
19. In terms of using K-State Online (Canvas), it is important to me to consider what my students think.	8.68%	80.15%

King Saud University

Out of 19 items in the survey related to organizational support of LMS adoption, participants at King Saud University either agreed or strongly agreed to only 4 items:

1) Forty three percent believed that the using Blackboard LMS fit into institution's vision, mission, and goals.
2) Forty three percent believed that the institution provides the technical infrastructure to support using Blackboard LMS in their courses.
3) Forty two percent believed it is important to me to consider what their peers think
4) Forty five percent believed it is important to me to consider what their students think

On the other hand, 46% to 50% of the participants either disagreed or strongly disagreed with several items about King Saud University's support, such as using an LMS to fit into the university's vision, providing technical support, and helping faculty members to utilize an LMS in order to better position themselves for rewards. Participants also felt that there was not a plan for the implementation of the LMS (Blackboard) in teaching practices, professional development was not provided, there was little support/encouragement from their supervisor, and using an LMS would not improve their image within their departments. Finally, 41% of the respondents did not consider what their students thought in terms of using the LMS (Blackboard).

Table 5.12 Descriptive Statistics of Organizational Support for King Saud University Participants

Organizational Support Related to the LMS Adoption	Disagree and Strongly Disagree	Agree and Strongly Agree

1. Using (Blackboard) fit into my institution's vision, mission, and goals.	46.15%	43.27%
2. My institution provides the technical infrastructure to support using (Blackboard) in my courses.	49.04%	43.27%
3. I am adequately rewarded/compensated for incorporating (Blackboard) in my teaching practices.	62.50%	21.15%
4. Using (Blackboard) enhances my ability to achieve tenure and promotion.	43.27%	34.62%
5. Technological skills/using (Blackboard) are important when making hiring/tenure decisions.	38.46%	37.50%
6. My institution has communication its strategic plan for the implementation of (Blackboard) in teaching practices.	40.38%	28.85%
7. I feel included in the dialogue about technology and distances education initiatives.	39.42%	34.62%
8. The procedure for establishing course web sites using (Blackboard) encourages faculty use of the system.	36.54%	29.81%
9. I am generally satisfied with the responses or resolution to problem(s) with (Blackboard).	36.54%	32.69%
10. My institution provides professional development activities to help faculty learn and use (Blackboard).	50.96%	36.54%
11. Professional development activities related to (Blackboard) have been effective.	41.35%	27.88%
12. The goals and objectives regarding use of (Blackboard) are shared by faculty as well as administration.	40.38%	25.00%
13. My supervisor supports/encourages the use of (Blackboard).	41.35%	37.50%
14. My colleagues think that I should use (Blackboard) for my course work.	38.46%	34.62%
15. People in my institution who use (Blackboard) have more prestige than those who do not.	33.65%	37.50%
16. Using (Blackboard) improve my image within my department or the institution.	43.27%	36.54%
17. Innovativeness and experimentation are encouraged at my institution	39.42%	39.42%
18. In terms of using (Blackboard), it is important to me to consider what my peers think.	34.62%	42.31%
19. In terms of using (Blackboard), it is important to me to consider what my students think.	41.35%	45.19%

Time Concern

Lack of time is one of the biggest barriers for adopting technology among faculty members. To understand the impact of time on an adoption decision regarding online learning and new technology, Cavanaugh (2005) found that faculty members were afraid to try online learning tools because of the workload and time requirement in the preparation and use of online courses. When comparing traditional face-to-face courses to online courses, the study found that online sections take twice the amount of time for grading online discussions and finishing class activities. Similarly, a study by Lazarus (2003) focused on the time needed to teach online courses. The largest amount of time commitment faculty members spent was on grading online discussion assignments. Other factors that affected the amount of time for each class included the class subject, course level, and students' academic level. This current research intends to draw the attention of educational leaders to the factors that might prevent faculty members from using technology such as an LMS. This research is concerned with how ignoring the impact of time could lead to unsuccessful adoptions of technology.

Some of the survey items are discussed below. More than 60 % of the survey participants at Kansas State University agreed or strongly agreed that training on how to use an LMS required extra time. Over 70% of the respondents believed that using an LMS allowed them to do more things than they could otherwise in a traditional course. In addition, 71% of the participants believed it was important to have mobile access to course content anytime and anywhere. On the other hand, 42% of the participants either disagreed or strongly disagreed that having an online course required more time than a traditional course.

Table 5.13 Descriptive Statistics of Time Concern for KSU Participants

Time Concern	Disagree and Strongly Disagree	Agree and Strongly Agree

1. Having a course in K-State Online (Canvas) requires more of my time than a traditional course.	42.68%	33.75%
2. Training on how to use K-State Online (Canvas) requires extra time out of my schedule.	20.84%	63.77%
3. It is important that K-State Online (Canvas) platform have mobile access so I can get my course content anytime and anywhere.	13.15%	71.46%
4. Using K-State Online (Canvas) platform allows me to do other things that a traditional course would not.	11.91%	70.47%
5. Taking course in K-State Online (Canvas) helps me manage my time better.	18.61%	43.67%

King Saud University

More than 46 % of the survey participants at King Saud University agreed or strongly agreed that having an online course required more time than a traditional course. Conversely, 48% of the participants disagreed or strongly disagreed that it was important that the Blackboard LMS should have mobile access to course content anytime and anywhere.

Table 5.14 Descriptive Statistics of Time Concern for King Saud University Participants

Time Concern	Disagree and Strongly Disagree	Agree and Strongly Agree
1. Having a course in (Blackboard) requires more of my time than a traditional course.	32.69%	46.15%
2. Training on how to use (Blackboard) requires extra time out of my schedule.	38.46%	36.54%
3. It is important that (Blackboard) platform have mobile access so I can get my course content anytime and anywhere.	48.08%	28.85%
4. Using (Blackboard) platform allows me to do other things that a traditional course would not.	36.54%	31.73%
5. Taking course in (Blackboard) helps me manage my time better.	38.46%	25.96%

Fear of Change in New Technology

Resistance to change plays an important role in accepting or rejecting new technology. According to Giangreco (2002), "Resistance to change is a form of organizational dissent to a change process (or practices) that the individual considers unpleasant or disagreeable or inconvenient on the basis of personal and/or group evaluations". With regard to the LMS, users might have resistance to use a new system because they have become accustomed to the current software and are comfortable with it.

More than 50 % of the survey participants at Kansas State University preferred face-to-face courses to online courses if the LMS was too complex to use. In addition, more than 45% of the respondents believed that using new technology such as an LMS provided a better environment in which the students could learn. On the other hand, 66% of the participants either disagreed or strongly disagreed that the privacy of assignments was threatened when using an LMS.

Table 5.15 Descriptive Statistics of Fear of Change for KSU Participants

Fear of Change	Disagree and Strongly Disagree	Agree and Strongly Agree
1. Changes in K-State Online (Canvas) negatively affect teaching and learning.	42.18%	17.62%
2. I prefer face-to-face courses to online courses if K-State Online (Canvas) is too complex to use.	20.60%	52.85%
3. Privacy of assignments is threatened when using K-State Online (Canvas).	66.25%	7.69%
4. Using K-State Online (Canvas) for teaching and learning create isolation between the student and instructor.	43.92%	28.29%
5. I feel that using new technology such as K-State Online (Canvas) provides a better environment to learn.	15.63%	45.91%

King Saud University

More than 38 % of the survey participants at King Saud University preferred face-to-face courses to online courses if the LMS was too complex to use. In addition, more than 33% of the respondents believed that changes in the Blackboard LMS negatively affected teaching and learning. On the other hand, 50% of the participants either disagreed or strongly disagreed that using Blackboard for teaching and learning isolated the students and instructor from each other. Moreover, 40% felt that using new technology such as Blackboard provided a better environment for students to learn.

Table 5.16 Descriptive Statistics of Fear of Change for King Saud University Participants

Fear of Change	Disagree and Strongly Disagree	Agree and Strongly Agree
1. Changes in (Blackboard) negatively affect teaching and learning.	35.58%	33.65%
2. I prefer face-to-face courses to online courses if (Blackboard) is too complex to use.	41.35%	38.46%
3. Privacy of assignments is threatened when using (Blackboard).	31.73%	31.73%
4. Using (Blackboard) for teaching and learning create isolation between the student and instructor.	50.00%	26.92%
5. I feel that using new technology such as (Blackboard) provides a better environment to learn.	40.38%	37.50%

Conclusions and Discussion

Research Question One

What is the relationship between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and Rogers's five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability)?

There was a statistically significant difference between faculty age and respondents' perceptions of the five attributes of innovation (relative advantage, compatibility, complexity, trialability, and observability). The age of the faculty members plays an important role in adopting and using technology, such as an LMS, for teaching. The youngest users (between the ages of 21-30) of the Canvas LMS show higher mean scores on four attributes of innovations (relative advantage, compatibility, complexity, and observability) than all other age groups. The results indicated that the younger group of faculty members at Kansas State University are more likely to adopt an LMS. In addition, new faculty members such as GTAs and lecturers have better perceptions toward technology adaptation in the higher education setting than older faculty members do.

These findings are consistent with previous studies that focused on the impact of age in technology use. Age was found to be a significant variable in (Adams, 2002; Petherbridge, 2007; Ruth, 1996; Shea, 2007). Adams (2002) found that instructors under 34 years old had a higher level of computer integration than instructors who were older. Similarly, Petherbridge (2007) found age as predictive of whether the faculty members used an LMS. Older faculty members had less interest learning about the LMS or using the system at all. Likewise, Ruth (1996) found that faculty members 45 and younger were more likely to use internet technology in their classes, and faculty members who were 46 and older were less interested in using these resources in their

courses. Also, Shea (2007) found that faculty members could be divided into two groups related to their age: faculty who were 45 years or older were not motivated to use online teaching because they saw it as a new learning approach. Younger faculty instructors were interested in using new learning styles because they believed it would help them to achieve tenure or promotion.

On the other hand, there were no statistical differences between the age of the faculty members at King Saud University and their perception and use of the Blackboard LMS. This finding is consistent with previous studies. North Carolina State University (2004) conducted a study of faculty experiences with computer-based instructional and learning aids with 1790 participants and a 55% response rate. No statistical significance was found between faculty members' ages and technology use in the courses. Similarly, two Concerns-Based Adoption Model studies found the same result (Hwu, 2011; Kamal, 2013).

Gender

Female participants showed a higher preference towards LMS usage than males in two attributes of innovation (relative advantage and compatibility). The results indicated that females are more likely to adopt an LMS than males.

These findings are related to other studies. Shea (2007) found that females were motivated to teach online classes because women have more domestic responsibilities than men. In addition, the study found that online teaching provided opportunities for women to manage their academic jobs and their family needs. Similarly, Almuqayteeb (2009) conducted a study on the female faculty use of technologies in Saudi Arabia. The study found the female faculty show positive attitudes toward using technology tools. In general, gender should be considered when designing professional training events regarding integrating technology such as an LMS for faculty members at Kansas State University.

On the other hand, there were no statistically significant differences between the gender of the faculty members at King Saud University and their perception and use of the Blackboard LMS. This result is similar to previous studies that did not find any differences between faculty members' gender and technology use. A study by Gerlich and Wilson (2004) at West Texas A&M University focused on the faculty perceptions of distance learning with 110 participants and 48% response rate. Thirty-nine of the faculty members were teaching online courses and 71 were not. The study found no statistically-significant differences between males and females who taught traditional (no- or low-technology) classes; only those who taught online classes showed any variation from others. This finding is similar to Petherbridge's (2007) study which found that gender had no statistically significant relationship with respect to concerns of adopting an LMS in teaching.

Years of Teaching Experience

The faculty members who had 1-3 years of teaching experience showed higher mean scores on four attributes of innovation (relative advantage, compatibility, complexity, and observability) than all other groups. These findings indicated that new faculty members with 1-3 years of teaching experience at Kansas State University were interested in using technology such as the Canvas LMS in their teaching. These findings correspond with other studies such as Lamboy and Bucker's (2003), which studied the relationship between how long faculty member had been teaching and their technology use. The researchers found that older faculty tended to use fewer technology tools in their teaching, and younger faculty showed higher levels of usage. Likewise, Alaugab (2007) focused on the barriers of Saudi female faculty members using online learning tools. The study found a relationship between the teaching experiences of the faculty member and online learning. Faculty who had more years of teaching experience showed less

attitude towards online teaching. This means that when the faculty member gains more experience, she is less interested in trying new teaching tools and instead prefers to use traditional teaching approaches.

On the other hand, there were no statistical differences between the number of years faculty members had been teaching at King Saud University and their perception and use of the Blackboard LMS. This result is consistent with previous studies at universities that found faculty use of technology such as an LMS were not influenced by their years of teaching experience (Al-sarrani, 2010; Kamal, 2013; Omar, 2016).

Academic rank

Faculty member perceptions of the Canvas LMS were influenced by their academic ranking. Faculty members who were assistant professors, lecturers, graduate teaching assistants, etc. showed higher mean scores on three attributes of innovations (relative advantage, compatibility, and complexity) than professors and associate professors. In other words, faculty members with two highest academic rankings showed less interest in adopting and using the Canvas LMS at Kansas State University. This finding is consistent with previous studies that investigated the relationship between academic rank and technology acceptance (Alnujaidi, 2008; Mwenda, 2010; Petherbridge, 2007). All of these studies emphasized that academic rank was a significant factor in adopting and using technology such as an LMS in a higher education environment.

On the other hand, there were no statistical differences between the academic rank of the faculty members at King Saud University and their perception and use of the Blackboard LMS. The result corresponds with three studies from different Saudi Universities (Al-Sarrani, 2010;

Kamal, 2013; Omar, 2016), which found no statistically significant differences between faculty academic rank and the adoption of technology.

In conclusion

These results illustrate the relationship between faculty personal characteristics and Rogers's five attributes of innovation and are consistent with Rogers' theory which mentioned about 49% to 87% of innovation adoption can be predicted according to five perceived attributes: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, (5) observability (Rogers, 2003). The faculty members who scour higher in the five attributes related to LMS were interesting to adopt with LMS

Research Question Two

What is the relationship between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and their perception of the organizational support related to the adoption of the learning management system (LMS)?

Age

For participants from Kansas State University, there was a statistically-significant difference between users that were 21-30 years old, users who were 41-50, and who were 61 years or older. There was an *M* of .31144 and a *P* of .020 with the 41-50 age group and an, *M* of .29761 and a *P* of .035 for faculty who were 61 or older. The result indicated that younger faculty members between the ages of 21-30 were more likely to use organizational support to assist in the adoption of technology such as an LMS.

On the other hand, for participants from King Saud University, there were no statistical differences between faculty members' age and organizational support related to LMS use. This

finding is consistent with previous studies that focused on gender differences and technology (Adams, 2002; Kagima and Hausafus 2000; Lane & Lyle, 2011; Owusu-Ansah, 2001).

Previous studies investigating the relationship between a faculty member's age and the provision of organizational support and the success in persuading the individual to adopt new technology. Adams (2002) found that younger faculty (between the ages of 18-34) also had a higher level of technology integration. Similarly, a study by Kagima and Hausafus (2000). They found that faculty who were 60 years or older were less confident in utilizing electronic communication in their courses. Likewise, Lane and Lyle (2011) conducted a study on obstacles and supports related to the use of educational technologies. Five hundred forty-seven faculty participated in the study at the University of Washington. Researchers found that older faculty have less experience using technology. In this case, direct administrative support was more helpful to older faculty than younger faculty. On the contrary, younger faculty members were more interested in using online support. Also, Owusu-Ansah (2001) investigated faculty concern regarding the use of technology. The study also found that older faculty members were not only less interested in using technology, but also not interested in learning new information about integrating technology.

On the other hand, Pereira and Wahi (2017) emphasized that faculty training on CMS is an essential element in the adoption process and use of CMS. Unlike other studies, the researchers found that older faculty were willing to complete training sessions about the functions and use of CMS.

Gender

A Tukey post test revealed a statistically significant difference between females and males. Female participants had a higher mean on organizational support of an LMS with an *M* of

.18679 and *SD* of .05785 versus male participants. This finding is consistent with previous studies that focused on gender differences and utilizing support for incorporating technology. (Almuqayteeb, 2009; Lane & Lyle, 2011; Pereira & Wahi, 2017 Schifter, 2002; Spotts, Bowman & Mertz, 1997;).

Gender and administrative support have been investigated in previous studies. Lane and Lyle (2011) conducted a study on obstacles and supports related to the use of educational technologies. Five hundred forty-seven faculty participated in this study at the University of Washington. The researchers found that female faculty found administrative support and workshops to be more helpful to them than males. Similarly, Pereira and Wahi (2017) found that female faculty members were more willing to complete online and face-to-face training on how to use CMS than males.

Other studies have mentioned that female faculty members faced difficulties when integrating technology. A study by Almuqayteeb (2009) conducted a study on attitudes of female faculty toward the use of computer technologies and the barriers that limit their use of technologies. The study included 197 female faculty members in Saudi Arabia. The study found that female faculty members need support in different areas such as technical support, access to technological equipment, and learning important information about technology tools. Similarly, Schifter (2002) found that females experience more difficulty than males when integrating technology in their teaching. The research indicated that a lack of background and technical support were important reasons to improve female technology integration. Likewise, Spotts, Bowman and Mertz (1997) found that male faculty members tended to show better information and knowledge about technology innovation than female. Lack of professional development was one of the important reasons that affected female faculty members' use of technology.

Conversely, there was no statistical significant between faculty members gender and organizational support related to LMS use at King Saud University. This finding is consistent with a previous study that investigated the impact of gender in the integration of technology among faculty members. McKinley et al. (2014) found no statistical differences between gender and attitude toward integrating technology. At the same time, professional development programs were integral to the adoption of technology in higher education settings.

Years of Teaching Experience

According to the ANOVA test, there was a statistical difference among the participants regarding to their years of teaching experience (P = .012) and their perceptions of organizational support related to LMS use at Kansas State University. In order to illustrate the difference among participants, a Tukey post hoc test was conducted. The results showed that there was a statistical difference between users in the group with 1-3 years of teaching experience and users in the groups of 11-20 and 21 years or more of experience with regard to the organizational support related to LMS use (M =.27505 and a P = .010 for users with 1-20 years of experience and M=.22183 and a P = .043 for users with more than 21 years of teaching experience). The results illustrate that new faculty members at Kansas State university with 1-3 and 4-10 years of teaching experience are more likely to use university support to adopt technology such as an LMS. This result is similar to previous studies by (Adams, 2002; Kamal, 2013; Omar, 2016; Petherbridge, 2007).

According to Adams (2002), faculty with 0 to 3 years of teaching experience had the highest level of concerns and a significantly higher level of technology integration than those with 10 to 19 years of teaching experience. In contrast, Petherbridge (2007) found that the participants' length of teaching experience was in the range of 9 to 24 years. The study found

that respondents were concerned about three types of support related to LMS adoption. The first one was the technical support while using the system. The second concern was training related to the LMS. The third concern was the faculty needs of knowledge that would encourage them to use an LMS for their students.

For King Saud University, there was no statistical difference between faculty members' years of teaching experience and organizational support related to LMS use. A study by Kamal (2013) focused on the professional development needs of faculty at King Abdulaziz University in Saudi Arabia when adopting online teaching. The study found no a statistically significant difference when comparing faculty concern in adopting online teaching and the faculty years of teaching experience, but Kamal mentioned interesting findings related to administrative support and professional development. The study emphasized that administrative support plays an integral role in the adoption of technology. Only 50% percent of the participants believed that the administrator in the department supported faculty members' use of technology.

In term of professional development, 74% of the participants agreed that they needed immediate training related to technology. In addition, 93% of the participants needed better access to the internet, and 75% participants needed technical support in terms of technology integration. Similarly, a study by Omar (2016) focused on the professional development needs of faculty at King Saud University in Saudi Arabia with regard to adopting online teaching. The study found only 177 out of 296 faculty used an LMS for at least one semester. Even though the study found no statistically significant differences between faculty concern in adopting online teaching and the number of years of faculty teaching experience, the study drew an important finding related to administrative support: only 55% percent of the participants, almost all of whom had fewer than 20 years of teaching experience, believed that the administrator in the

department supported the faculty members' use of technology. Moreover, 80% of the participants agreed that they needed immediate training related to technology, while 87% indicated that they needed technical support related to technology integration.

Academic rank

The ANOVA test showed that there was a statistical difference among participants regarding to their academic rank ($P = .008$) and organizational support related to LMS use at Kansas State University. A Tukey post hoc test was conducted to illustrate the differences among participants by their academic rank. The results showed that there was a statistical difference between users according to their academic rank and their response to organizational support related to the Canvas LMS. The post hoc test results showed that graduate teaching assistants had an *M* of .29786 and a *P* of .019 compared with professors. Also, GTAs had an *M* of 30289 and a *P* of .024 when compared with associate professors. Graduate teaching assistants showed a higher mean related to organizational support and LMS use than all other academic ranks at Kansas State University.

The result indicates that lower-ranking faculty members such as GTAs are more likely to use university support related adopting technology such as an LMS. GTAs show positive perceptions toward the university effort to make the Canvas LMS usable among faculty members. This finding is consistent with previous studies. A study by Al-Shboul (2013) investigated the level of learning management systems integration at the University of Jordan. The study emphasized that faculty members with higher academic ranks were less likely to use eLearning tools. The study found different factors inhabit faculty members' (including assistant professors', associate professors' and professors') use of the Blackboard LMS. These factors are related to organizational supports such as training, development, workload, negative feedback

from peers about the LMS, and technological background. Similarly, Petherbridge (2007) found that academic rank was predictive of faculty concerns related to LMS adoption. This study found that "respondents who are tenured or with the rank of instructor had lower self-personal concerns than other faculty, implying tenured faculty, or those hired with a teaching focus, are not as worried about the rewards structure for using technology" (Petherbridge, 2007, p. 269).

Gordon et al. (2018) focused on the faculty perceptions of the LMS at University of La Verne in California. The participants in the study were full time faculty members who were mostly over fifty years old. The participants believed that organizational support, including clear policies, support for teaching online, and training for faculty members and students, were fundamental aspects to integrate technology (Gordon et al., 2018).

Gautreau (2011) conducted a study on the motivational factors that influence faculty members' adoption decisions of an LMS at the University of Southern California. The study found a significant relationship between the academic ranks and whether a faculty member adopted technology in his or her course. Untenured faculty were more interested in using available resources such as technology tools to improve their teaching and help improve students' experiences. On the other hand, for King Saud University, there was no statistical difference between users according to their academic rank and university support related to adopting technology such as an LMS. This finding is consistent with previous study by Omar (2016) study he found no statistically significant differences in faculty concerns in adopting online teaching and administrative support of online teaching at King Saud University.

Research Question Three

What is the relationship between faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) and time concern and fear of change of new technology related to learning management system use?

Pillai's Trace test results showed a statistically significant difference between faculty academic rank and fear of change of new technology at Kansas State University. In addition, there was no statistically significant difference for faculty members in all independent variables (age, gender, academic ranking, and years of teaching experience) and time concern related to LMS use. A statistically significant difference was found between academic ranking and fear of change of new technology.

On the other hand, there was no statistically significant difference for faculty members at King Saud University in all independent variables (age, gender, academic ranking, and years of teaching experience and time concern and fear of change of new technology related to the LMS use.

These findings are consistent with other studies on Saudi universities (Al-Sarrani, 2010; Kamal, 2013). They found no significant relationship between academic rank and technology adoption. As result, faculty were not concerned about using technology. Al-Sarrani (2010) found that there was no statistical significance between faculty teaching experience and using blended learning, which required an LMS system to deliver information and knowledge.

Concerns about time as barrier of adopting technology among faculty members have been studied in the past. Moukali (2012) conducted a study on the factors that influence faculty attitudes toward adoption of technology. The study participants were 303 faculty members at Jazan University, Saudi Arabia. The study found that workload related to adopting technology

did not influence the adoption of technology such as an LMS. However, the study found that a lack of training was the main factor that negatively affected faculty adoption of technology. Alhawiti (2011) investigated faculty perceptions of attributes and barriers impacting diffusion of online education at two Saudi universities. The study found no statistically significant difference between time concern and technology adoption.

Academic rank

To determine the significant difference among participants at Kansas State University, a dependent Analysis of Variance (ANOVA) test was conducted. There was a statistical difference among participants regarding their academic rank (P = .000) and fear of change of technology related to LMS use. A Tukey post hoc test was conducted to illustrate the difference among participants regarding their academic rank. The post hoc test results showed that associate professors had an M of .29741 and a P of .041 compared with lecturers. Graduate teaching assistants had an M of .26536 and a P of .022 when compared to assistant professors. In addition, there was a difference when comparing GTAs (M of 36296 and a P of .005) with lecturers. Also, there was a difference between GTAs (M of 27344 and a P of .020) and others such as instructors. Finally, an associate professor had a higher mean only when compared with a lecturer. In contrast, GTAs showed a higher mean than all other academic ranks at Kansas State University.

These findings are consistent with previous studies (Hackbarth, Grover, and Yi 2003; Kamal, 2013; Lloyd, Byrne, & McCoy, 2012; Sinclair, & Aho, 2018; Walker, 2014). Hackbarth, Grover, and Yi (2003) mentioned that experiences and knowledge can help users to decrease the anxiety level toward technology. In other words, faculty members with more technological experience should have little fear toward technology and willingly/easily explore new tools.

Similarly, Kamal (2013) found that faculty members who used an LMS for more than three semesters were able to use more advanced system features than those who had not used the LMS for as long. Also, Lloyd, Byrne, and McCoy (2012) found that faculty members with less online teaching experience faced more interpersonal challenges than instructors who had more online teaching experience, which explains why GTAs scored a higher mean than other academic ranks who had more experience. This additional experience allowed them to be more comfortable with an LMS. Sinclair and Aho (2018) found that fear of new technology was one of the most important barriers that faculty members faced while using an LMS. This fear can take different forms such as a fear that technology may replace the face-to-face traditional classroom. Walker (2014) studied the attributes and barriers that influence the adoption of a learning management system at Texas A&M University. The study found a significant impact of fear of change and technology as negative barrier that influenced faculty member adoption decisions.

Recommendations for Kansas State University

The study investigated the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experiences) and their adoption of a learning management system (LMS) at Kansas State University. These recommendations based on the study findings would help university leaders and decision makers adopt technology such as an LMS in the higher education setting.

1. **Considering the impact of faculty age when implementing LMS**

The research findings indicated a clear connection between the instructors' age and LMS adoption and usage. The youngest group users (i.e., age 21-30) of the Canvas LMS showed higher mean scores on four attributes of innovations (relative advantage, compatibility, complexity, and observability) than all other age groups. The results indicated that the youngest

faculty members at Kansas State University are more likely to adopt an LMS. In addition, new faculty members such as GTAs and lecturers have better perceptions toward technology integrations in higher education than older faculty members.

It is essential to design a training program that meets older faculty members' needs such as face-to-face meetings with a specialist in Canvas on the university campus. The program should focus on the advantages of using the LMS as a delivery platform and a connection tool between the instructor and students.

2. Faculty gender influences the adoption process of LMS

Fifty percent of the survey participants were male and 48% of the participants were female. Female participants showed a higher perception towards LMS usage than males in two attributes of innovation (relative advantage and compatibility). The results indicated that females were more likely to adopt the LMS than males. The recommendation is to provide professional development programs that are convenient for male faculty members' schedules.

3. Academic rank is factor that plays an important role in the adoption process of an LMS

The study results showed that faculty members with higher academic ranking (professor and associate professor) were less interested in adopting and using the Canvas LMS at Kansas State University. Providing enough information about Canvas and demonstrating how using the system for teaching is critical for these two groups of faculty members because lack of knowledge about innovation would decrease the adoption among users. Rogers mentioned that knowledge is the first stage of the innovation decision process and is a fundamental component of innovation diffusion and adoption (Rogers, 2003). Similarly, Zeleny (2012)

emphasized that people will use new technology when they know it is useful to them and will make their life easier. Since the university is moving toward integrating technology to make a better learning environment for instructors and students, academic rank should be considered in the instructional technology plan for new technology. In addition, the result indicates that lower-ranking faculty members, such as GTAs, are more likely to use university support to adopt new technology such as an LMS. GTAs show positive perspectives toward the university effort to make Canvas usable among faculty members.

4. **Workshops and training related to technology should consider faculty members years of teaching experience.**

Faculty members who had 1-3 years of teaching experience showed higher mean scores on four attributes of innovations (relative advantage, compatibility, complexity, and observability) than all other groups. This finding indicated that new faculty members with 1-3 years of teaching experience at Kansas State University were interested in using technology in their teaching. In addition, the result illustrated that new faculty members at Kansas State university with 1-3 and 4-10 years of teaching experience were more likely to use university support to facilitate adoption of technology such as an LMS.

5. **Faculty members and compatibility with Canvas LMS**

Faculty members at Kansas State University were concerned about a lack of direct interpersonal contact and feedback from students while using Canvas. It is important to clarify that using an LMS system would not replace face-to-face interaction between instructor and students. An LMS helps users stay organized. It also provides useful and efficient communication features such as automatic notifications of due dates and tools that facilitate discussion and group projects (Rubin, et al., 2010).

6. **Faculty members and complexity with Canvas LMS**

According to Rogers (2003), complexity is "the degree to which an innovation is perceived as relatively difficult to understand and use" (p. 257). When surveyed about complexity related to LMS use, 21% of the faculty members at Kansas State University faced difficulty in remembering how to perform tasks in Canvas. The training programs should provide a better solution for this group of users who faced challenges in remembering mutable steps and functions of the system.

7. **Faculty members and trialability with Canvas LMS**

One of the surprising findings is that almost 25% of the faculty members were not able to try Canvas before using it for their courses. For this reason, encouraging faculty to have a sample course on Canvas is a great way to increase the number of adopters and understand the different tools within the LMS.

8. **Faculty members and observability with Canvas LMS**

The survey results showed that 31% of the faculty members were not able to observe how other instructors are using Canvas LMS. Of this, 25 were professors, 24 were associate professors, 31 were assistant professors, 10 were lecturers, and 10 were graduate teaching assistants. There were also 26 others not represented in these categories.

This finding is useful to predict one reason that might reduce the users' number how are not able to use the system beforehand. Rogers emphasized that individuals tend to adopt innovations that are easily observed (2003 p. 259). Kansas State University needs to create activities that allow instructors to share their experiences with Canvas LMS for teaching and communication purposes.

9. **Organizational support needed to improve the adopters of Canvas LMS**

The study showed that 47% of the faculty felt they were not involved in the decision related to technology adoption and distance learning at the university. In addition, 40% of the faculty disagreed that the university encouraged them to use the LMS by providing rewards those who used Canvas. Finally, 30% of the participants believed that the university had no clear plan for implementing Canvas.

These results require the university to redesign integrating technology plans that offer opportunities to faculty members to become involved in the technology decision. Also, the university needs to make a reward program for those who use Canvas effectively to influence others to follow them. The last recommendation is to have a clear plan for implementing the Canvas LMS. Faculty members should have easy access to the plan to see the goals of using the LMS.

10.Time release is needed to improve the adoption process

More than 60% of the faculty members who participated in the study believed that training on how to use Canvas require extra time out of their schedule. To address this issue, university needs to select the right time to introduce new technology to the instructors. For example, at the beginning of each semester is a better time. Another option is at the end of the summer which can be a great time for some instructors to prepare for the fall semester.

11.Overcome fear of change related to new technology to improve the adoption process

Complexity of the system was the big concern that 52% of the participants would prefer face-to-face courses to online courses if Canvas LMS is too complex to use using. The second barriers got 28% of faculty who believed that using Canvas LMS create isolation between them

and students. The last concern was from 17% of the participants who believed that changes such as updates in the LMS would negatively affect their usage of the system.

Kansas State University needs to take all the above concerns related to complexity, isolation, and changes in the system as priorities that should be covered in the workshops. In addition, sharing success stories from other instructors at Kansas State University would be a great strategy to positively influence others to overcome these concerns.

Recommendations for King Saud University

The study investigated the relationships between faculty personal characteristics (age, gender, academic ranking, and years of teaching experiences) and their adoption of the learning management system (LMS) at Kansas State University and compared that with faculty members at King Saud University in Saudi Arabia. The findings will help university leaders and decision makers in adopting technology such as an LMS in the higher education setting.

1. **Faculty personal characteristics (age, gender, academic ranking, and years of teaching experience) play an important role in the adoption process of LMS**

Even though there were no statistically significant differences between faculty personal characteristics at King Saud University and Rogers' five attributes of innovation, the university should not ignore the impact of personal characteristics. The result of Kansas State University clearly illustrates the relationships between demographic characteristics and Rogers' five attributes of innovation. Therefore, professional development programs at King Saud University related to LMS and technology use for learning purposes should target all faculty members regardless of their age, gender, academic ranking, and years of teaching experiences. Nowadays, students' needs are consistent with LMS features such as providing faster feedback, accessing

learning materials anywhere and anytime, checking grades with their smartphones and keeping in touch with classmates online.

2. Faculty members and relative advantages with Blackboard LMS

More than forty-five percent of the faculty members at King Saud University did not believe that an LMS would improve their quality of teaching, make their work easier, manage their courses or other advantages listed in the survey items. In contrast, 25% of the participants at Kansas State University either disagreed or strongly disagreed with the relative advantages of an LMS. The recommendation is that King Saud University needs to consider the impact of users' lack of knowledge related to the Blackboard system. A relative advantage is "the degree to which an innovation is perceived as being better than the idea it supersedes" (Rogers, 2003, p. 229). Many diffusion researchers indicate that relative advantage is one of the useful ways to predict the rate of adopting an innovation (Hafizah & Kamil, 2009, p. 59).

3. Faculty members and compatibility with Blackboard LMS

Forty percent of the participants either disagreed or strongly disagreed that Blackboard fit well with their teaching style, supported their philosophy of teaching, was compatible with students' needs, and was compatible with the
resources they used in their courses. Conversely, only 16% of the Kansas State University participants experienced the incompatibility issues with the LMS. Furthermore, 44% of the participants at King Saud University felt uncomfortable using Blackboard LMS and 41% of the participants saw Blackboard as incompatible with their level of technology expertise.

The recommendation is that King Saud University needs to consider the importance of introducing an innovation as compatible with the users' needs. Rogers,
(2003) defined compatibility as "the degree to which an innovation is perceived as consistent

with the existing values, past experiences, and needs of potential adopters" (p. 240). The workshops and training programs for an LMS must meet the needs of the faculty members. In addition, instructors should see clearly how an LMS would help improve their way of teaching; otherwise, there will be a risk of rejection.

4. **Faculty members and complexity with Blackboard LMS**

More than forty percent of the participants faced difficulty and challenges with the Blackboard LMS. Specifically, 46% of the participants faced a problem with using Blackboard for grading at King Saud University. This is compared to 15% of the participants at Kansas State University who had difficulties and challenges with the Canvas LMS, but only 13% of them faced issues with grading. King Saud University needs to provide support and focus on these issues to help users overcome these challenges. It is important that an LMS is perceived as easy to use to be adopted and expanded upon.

5. **Faculty members and trialability with Blackboard LMS**

Almost fifty percent of the survey participants at King Saud University were not able to try Blackboard LMS features to understand what the system could do for them. Consequently, the participants either disagreed or strongly disagreed that they had a chance to experiment with the learning system before using it in their courses. In contrast, only 24% of the faculty members at Kansas State University faced these issues. This finding required the university to take action to solve the problem by introducing the system in stages to allow instructors to use each part and develop personal experience to increase their understanding of how the LMS works. If users receive an innovation such as an LMS in one part that cannot be divided, it is likely to be rejected according to Rogers.

6. **Faculty members and observability with Blackboard LMS**

Forty-seven percent of the participants were not able to observe how other teachers are using Blackboard LMS and 41% of the participants were not able to explain why using Blackboard may or may not be beneficial. King Saud University needs to create activities that allow instructors to observe others who are using LMS effectively. This will help the university to use a positive influence of peers to increase the rate of adoption.

7. **Organizational support needed to improve the adopters of Blackboard LMS**

Around fifty percent of the participants either disagreed or strongly disagreed with several items related to organizational support such as using LMS and university's vision, the technical support, receive rewards, and a plan for the implementation Blackboard. Furthermore, 41% did not consider what their students think in terms of using Blackboard. In contrast, 70% of the participants at Kansas State University believed that using LMS fits into the university vision, and 65% agree or strongly agree that Kansas State University provides professional development activities to help faculty learn how to use LMS.

These results require King Saud University to keep technical support and professional development as priority services when introducing a new technology tool. In addition, the university needs to provide information to support faculty's decision of adopting new system, so the users understand the benefits and goals that university try to achieve. Also, the university needs to make a reward program for those who use Blackboard effectively to influence others to follow them. The last recommendation is to have a clear plan for implementing Blackboard LMS, and faculty members should have easy access to this plan to see the goals of using the LMS.

8. **Time release is needed to improve the adoption process**

More than forty-six percent of the survey participants at King Saud University and thirty-three percent at Kansas State University agreed or strongly agreed that having an online course required more time than a traditional course. On the other hand, 48% of the participants at King Saud University disagreed or strongly disagreed that it was important that the Blackboard LMS should have mobile access to course content anytime and anywhere. Conversely, 71% of the participants at Kansas State University agreed or strongly agreed that it was important that LMS have mobile access to course content anytime and anywhere.

The survey finding gives King Saud University an idea about the faculty concerns and needs. As a consequence, the university should introduce an innovation such as an LMS as a useful tool that would help faculty to manage their courses and make the communication process easier with their students. In addition, the university should improve the awareness level about the opportunities that new system would provide to the users, which may increase the adoption process. Zeleny (2012) believes that people will use new technology when they know it is useful to them and will make their life easier.

9. Overcome fear of change related to new technology to improve the adoption process

Thirty-eight percent of the participants preferred face-to-face courses to online courses if Blackboard was too complex to use, 33% of participants believed that changes in Blackboard negatively affected teaching and learning, and 31% see privacy as a concern when using Blackboard. However, 52% of respondents at Kansas State University preferred face-to-face if the LMS was too complex to use, 17% agreed that changes in the LMS negatively affected their teaching, and 7% were concerned about privacy when using LMS.

King Saud University needs to reduce the fear level toward using the LMS by providing technical support and online guidelines on how to use the system. To illustrate, when new updates are released into the system, technical support should provide LMS workshops. Thus, faculty members will adjust with new features in the new update.

10. Increase participation numbers in the research.

One of the greatest barriers that I faced with faculty members at King Saud university was the limited participant numbers who were willing to complete the survey. The researcher had no control over the reminder system that would help him to send multiple reminders to increase the participant numbers. In addition, the university allowed researchers to send only one email to the list that was created by the Office of Research. In some cases, the survey might be sent at the end of the week to faculty who were mostly ready to take a break away from their university emails.

11. Tutorial videos to explain Blackboard's features.

I recommend that King Saud University send tutorial videos to the faculty members at the beginning of each semester through the university email. The goal is to increase the number of users as well as increase faculty members' awareness of the system features.

12. Evaluate users experience of Blackboard.

King Saud University needs to consider faculty members' experience with the LMS by sending a survey at the end of each semester. It is an important part of the adoption process of the LMS because it will led to improvements for users and the system.

Recommendations for Future Research

1. There is a lack of studies that discuss demographics and Rogers's five attributes of innovation.

2. Faculty personal characteristics and organizational support related to LMS were not covered enough in the previous studies.
3. There is a need for studies that investigate the influence of faculty personal characteristics focusing on time concern and fear of change regarding LMS use.
4. The study used a quantitative research method to gather information from two large universities in two different countries. I would suggest adding interviews with faculty members to get in-depth understanding about the personal experiences with LMS use.
5. It is recommended for researchers who are interested in King Saud University to get support from deans and other stakeholders at the university to improve the response rate.
6. In this study, Kansas State University used Canvas LMS and King Saud University used Blackboard LMS. I suggest that new research to try to compare two universities with the same learning system to eliminate the differences between the systems.
7. I suggest that new research in the education technology field make connections with the university and stakeholders in order to meet their needs.
8. In this study, I focused on time concern and fear of change of new technology and their negative impacts on faculty use of LMS. New research should add more factors that might inhibit faculty members' use of the LMS.
9. I would encourage new research to include students with faculty members to understand the students' perspectives and use of the LMS and how learners interact with learning technology tools.

10. I recommend new research in the field of educational technology and LMSs, especially in finding another university in Saudi Arabia and comparing it to King Saud University.

References

Adams, N. B. (2002). Educational computing concerns of postsecondary faculty. Journal of Research on Technology in Education, 34(3), 285 – 303.

Al Meajel, T., & Sharadgah, M. (2018). Barriers to Using the Blackboard System in Teaching and Learning: Faculty Perceptions. Technology, Knowledge and Learning, 23(2), 351-366.

Al-Sarrani, N. (2010). Concerns and professional development needs of science faculty at Taibah University in adopting blended learning. (Doctoral dissertation). Retrieved from K-State Research Exchange.

Al-Senaidi, L., & Poirot. (2009). Barriers to adopting technology for teaching and learning in Oman. *Computers & Education, 53*(3), 575-590.

Al-Shboul, M. (2013). The Level of E-Learning Integration at the University of Jordan: Challenges and Opportunities. International Education Studies, 6(4), 93.

Alaugab, A. M. (2007). Benefits, barriers, and attitudes of saudi female faculty and students toward online learning in higher education (Order No. 3258686). Available from ProQuest Dissertations & Theses Global. (304847697). Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/304847697?accountid=11789

Alhawiti, M. M. (2011). Faculty perceptions about attributes and barriers impacting the diffusion of online education in two Saudi universities (Doctoral dissertation).

Alias, N. A., & Zainuddin, A. M. (2005). Innovation for better teaching and learning: Adopting the learning management system. *Malaysian Online Journal of Instructional Technology, 2(*2), 27–40.

Allen, I. E., & Seaman, J. (2010). Class differences: Online education in the United States 2010.

In B. S. R. Group (Ed.), *National and regional Sloan surveys of online education.* Newburyport, MA: The Sloan Consortium.

Almuqayteeb, T. A. (2009). Attitudes of female faculty toward the use of computer technologies and the barriers that limit their use of technologies in girls' colleges in saudi arabia (Order No. 3380496). Available from ProQuest Dissertations & Theses Global. (304941987). Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/304941987?accountid=11789

Alnujaidi, S. A. (2008). Factors influencing English language faculty members' adoption and integration of Web-Based Instruction (WBI) in Saudi Arabia. (Doctoral dissertation, University of Kansas).

Alturki, U., Aldraiweesh, & Kinshuck. (2016). Evaluating the Usability and Accessibility of LMS "Blackboard" at King Saud University. Contemporary Issues in Education Research, 9(1), 33.

Aron, A., Aron, E. N., & Coups, E. J. (2005). *Statistics for the behavioral and social: A brief course* (3th ed.). Upper Saddle River, N.J: Pearson Education.

Asiri, M. J., Mahmud, R., Bakar, K. A., & Ayub, A. F. M. (2012). Role of attitude in utilization of Jusur LMS in Saudi Arabian Universities. *Social and Behavioral Sciences, 64,* 525–534.

Asiri, Mohammed J. Sherbib, Mahmud, Rosnaini bt, Bakar, Kamariah Abu, & Ayub, Ahmad Fauzi bin Mohd. (2012). Factors Influencing the Use of Learning Management System in Saudi Arabian Higher Education: A Theoretical Framework. *Higher Education Studies,* 2(2), 125-137

Babbie, E. (1990). *Survey research methods* (2nd ed.). Belmont, Calif: Wadsworth Pub.

Bates, T. (2000). *Managing technological change: Strategies for college and university leaders.* San Francisco, CA: John Wiley & Sons, Inc.

Bennett, J., & Bennett, L. (2003). A review of factors that influence the diffusion of innovation when structuring a faculty training program. The Internet and Higher Education, 6(1), 53-63.

Berge, Z. L. (1998). Barriers to online teaching in post-secondary institutions: Can policy changes fix it. *Online Journal of Distance Learning Administration, 1*(2), 2

Black, E. W., Beck, D., Dawson, K., Jinks, S., & DiPietro, M. (2007). The other side of the LMS: Considering implementation and use in the adoption of an LMS in online and blended learning environments. *Techtrends: Linking Research & Practice To Improve Learning, 51*(2), 35-39. doi:10.1007/s11528-007-0024-x

Bok, D. (2015). *Higher education in America* (First revised edition. ed.). Princeton, New Jersey: Princeton University Press.

Bousbahi, F., & Alrazgan, M. (2015). Investigating IT Faculty Resistance to Learning Management System Adoption Using Latent Variables in an Acceptance Technology Model. The Scientific World Journal, 2015, 11.

Brill, J. M., & Galloway, C. (2007). Perils and promises: University instructors' integration of technology in classroom-based practices. *British Journal of Educational Technology, 38*(1), 95-105. doi:10.1111/j.1467-8535.2006.00601.x

Brown, A. H., Benson, B., & Uhde, A. P. (2004). You're doing what with technology? An expose on "Jane Doe" college professor. *College Teaching, 52*(3), 100-105

Butler, D. L., & Sellbom, M. (2002). Barriers to adopting technology for teaching and learning and learning in Oman. Computer & Educatio, 53(3), 575.

Canvas LMS (2018) Retrieved from https://www.instructure.com/canvas/

Cavanaugh, J. (2005). Teaching online-A time comparison. *Online Journal of Distance Learning Administration, 8*(1), 2005.

Çeliköz, N., & Erdoğan, P. (2017). The investigation of preparatory school students' attitudes towards learning management system. (English). *International Online Journal Of Educational Sciences, 9*(1), 243-261. Cengage Learning.

Chang, C. L. (2008). Faculty perceptions and utilization of a learning management system in higher education (Order No. 3319031). Available from ProQuest Dissertations & Theses Global. (304488376). Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/304488376?accountid=11789

Chizmar, J. F., & Williams, D. B. (2001). What do faculty want? *Educause Quarterly 24*(1), 18–24.

Chou, A. Y., & Chou, D. C. (2011). Course management systems and blended learning: An innovative learning approach. *Decision Sciences Journal of Innovative Education, 9*(3), 463-484. doi:10.1111/j.1540-4609.2011. 00325.x

Coaldrake, P., & Stedman, L. (1999). Academic work in the twenty-first Century: *Changing Roles and Policies*. Retrieved from file:///Users/labguest/Downloads/Occasional%20paper.pdf

Coates, H., James, R., & Baldwin, G. (2005). A critical examination of the effects of learning management systems on university teaching and learning. *Tertiary Education and Management, 11* (1), 19-36.

Cohen, L. (2000). *Research methods in education* (5th ed.). London; New York:

Colleges and Academic Units (2018) Retrieved from https://www.k-

state.edu/directories/academic.html

Collis, B. (1999). Designing for differences: cultural issues in the design of WWW-based course-support sites. *British Journal of Educational Technology, 30*(3), 201.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). New Jersey: Pearson Education Inc.

Daniels, P. (2009). Course management systems and implications for practice. *International Journal of Emerging Technologies and Society, 7*(2), 97-108. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/223212695?accountid=11789

De Vaus, D. A. (2001) *Research Design in Social Research*, Sage, London

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, Mail, and Mixed-Mode Surveys:* The Tailored Design Method (Third Edition). Toronto: Wiley.

Dillman, Don A., Smyth, Jolene D., & Christian, Lean Melani. (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys:* The Tailored Design Method, 4th Edition. John Wiley & Sons, 10475 Crosspoint Boulevard, Indianapolis, IN 46256.

Educause Quarterly, 25(2), 22-28.

Ehlers, U., & Schneckenberg, D. (2010). *Changing cultures in higher education moving ahead to future learning.* Berlin: Springer.

El Zawaidy, H. (2014). Using Blackboard in online learning at Saudi universities: Faculty member's perceptions and existing obstacles. International Interdisciplinary Journal of Education., 1(1457), 1.

Eldridge, B. A. (2014). Exploring faculty adoption and utilization of blackboard at a community college in the kentucky community and technical college system (Order No. 3691866). Available from ProQuest Dissertations & Theses Global. (1673630917). Retrieved from

http://search.proquest.com.er.lib.k-state.edu/docview/1673630917?accountid=11789

Eneh, O. C. (2010). Technology transfer, adoption and integration: A review. *Journal of Applied Sciences*, 10(16), 1814-1819.

Ferdousi, B. J. (2009). *A study of factors that affect instructors' intention to use e-learning systems in two-year colleges* (Doctoral dissertation).. Retrieved from ProQuest Dissertations & Theses Global. (Order No. 3352474).

Field, A. (2013). *Discovering Statistics using IBM SPSS Statistics* (4 ed.). London: SAGE.

Fulk, J. (1993). Social construction of communication technology. *Academy of Management Journal 36(5), 921-950.*

Garrison, & Kanuka. (2004). Blended learning: Uncovering its transformative potential in higher education. The Internet and Higher Education, 7(2), 95-105.

Gautreau, C. (2011). Motivational factors affecting the integration of a learning management system by faculty. The Journal of Educators Online., 8(1), N1.

Gay, L. R. (1996). *Educational research: Competencies for analysis and application* (5th ed.). Upper Saddle River, N.J.: Prentice-Hall.

Georgina, David A., & Olson, Myrna R. (2008). Integration of Technology in Higher Education: A Review of Faculty Self-Perceptions. *Internet and Higher Education*, 11(1), 1-8.

Gerlich, R., & Wilson, P. (2004). DISTANCE LEARNING AND THE FACULTY: AN ANALYSIS OF PERCEPTIONS, CONCERNS, AND OPPORTUNITIES. Allied Academies International Conference. Academy of Educational Leadership. Proceedings, 9(1), 19.

Giangreco, A. (2002). Conceptualization and operationalisation of resistance to change. Liuc Papers n., 103, 1-28.

Gibson, S. G., Harris, M. L., & Colaric, S. M. (2008). Technology acceptance in an academic context: Faculty acceptance of online education. Journal of Education for Business, 83,355-359.

Gikas, & Grant. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. The Internet and Higher Education, 19, 18-26.

Gordon, L., Gratz, E., Kung, D., Moore, L., & Urbizagastegui, S. (2018). Utilization of Information Technology as Instructional Support in Higher Education--A Case Study. Communications of the IIMA, 16(1), 1-23.

Hackbarth, G., Grover, V., & Mun, Y. Y. (2003). Computer playfulness and anxiety: positive and negative mediators of the system experience effect on perceived ease of use. Information & management, 40(3), 221-232.

Hafizah, M. H., & Kamil M. I. (2009). E-learning adoption: The role of relative advantages, trialability and academic specialisation. *Campus-Wide Information Systems, 26*(1), 54-70. doi: http://dx.doi.org.er.lib.k-state.edu/10.1108/10650740910921564

Hall, G.E., George, A.A., & Rutherford, W.L. (1979). Measuring stages of concern about the innovation: A manual for use of the SoC questionnaire (2nd ed.). Austin, TX: Southwest Educational Development Laboratory

Han, I., & Shin, W. S. (2016). The use of a mobile learning management system and academic achievement of online students. Computers & Education, 102, 79-89.

Hazen, B. T., Wu, Y., Sankar, C. S., & Jones-Farmer, A. (2012). A proposed framework for educational innovation dissemination. *Journal of Educational Technology Systems, 40*(3),

301-321. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/1018478695?accountid=11789

Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development, 55*(3), 223-252.

Hollabaugh, G. T. (2016). Student perceptions and intent to use mobile learning devices in a university classroom setting (Order No. 10254385). Available from ProQuest Dissertations & Theses Global. (1875046642). Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/1875046642?accountid=11789

Hong-Ren, C., & Hui-Ling, H. (2010). User acceptance of mobile knowledge management learning system: Design and analysis. *Journal Of Educational Technology & Society, 13*(3), 70-77.

Hultman, K. (2003). Resistance to change, managing. *Encyclopedia of Information Systems, 3*, 693-705.

Hwu, S. (2011). Concerns and professional development needs of university faculty in adopting online learning (Order No. 3493794). Available from Dissertations & Theses @ Kansas State University; ProQuest Dissertations & Theses Global. (919694151). Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/919694151?accountid=11789

Hyungsung Park. (2005). Design and development of a mobile learning management system adaptive to learning style of students. IEEE International Workshop on Wireless and Mobile Technologies in Education (WMTE'05), 67-69.

Internet World Stats (2019). Retrieved from http://www.internetworldstats.com/

Intharaksa, U. (2009). *Using diffusion of innovation theory to explain the degree of faculty*

adoption of web-based instruction in a thai university (Order No. 3390912). Available from ProQuest Dissertations & Theses Global. (305083275). Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/305083275?accountid=11789

Januszewski, A., & Molenda, M. (2013). Educational technology: A definition with commentary. Taylor and Francis.

K-State Today. (2014, July10) From chief information officer Ken Stafford: Canvas Learning Management System. Retrieved from https://www.kstate.edu/today/announcement.php?id=14636

Kagima, L. K., & Hausafus, C. O. (2000). Integration of electronic communication in higher education: Contributions of faculty computer self-efficacy. Internet and Higher Education, 2(4), 221-235.

Kamal, B. (2013). Concerns and professional development needs of faculty at King Abdul-Aziz University in Saudi Arabia in adopting online teaching. (Doctoral dissertation). Retrieved from K-State Research Exchange.

Kansas State University (2017). About K-state Retrieved from: http://www.k-state.edu/preview/about/stats-strengths/index.html

Kansas State University (2018) Students Canvas LMS page. Retrieved from https://k-state.instructure.com/

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. Business Horizons, 53(1), 59-68.

Karagiorgi, Y. (2005). Throwing light into the black box of implementation: ICT in Cyprus elementary schools. *Educational Media International, 42*(1), 19-32.

Karahasanovic, A., Brandtzaeg, Vanattenhoven, Lievens, Nielsen, & Pierson. (2009). Ensuring Trust, Privacy, and Etiquette in Web 2.0 Applications. Computer, 42(6), 42-49.

Keesee, G. S. (2010). *Perceived attributes and organizational support influencing course management system adopter status in historically black colleges and universities* (Order No. 3426608). Available from ProQuest Dissertations & Theses Global. (763195860). Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/763195860?accountid=11789

Kelly, T. (2005). *A case study of a college faculty's' use of technology, professional development and perceptions of organizational support* (Dotoral dissertation). Retrieved from ProQuest Dissertations & Theses Global. (Order No. 3175018)

King Saud University (2018) Blackboard LMS. Retrieved from https://lms.ksu.edu.sa

King Saud University (2018) Instructor Blackboard page. Retrieved from https://lms.ksu.edu.sa/webapps/portal/execute/tabs/tabAction?tab_tab_group_id=_1_1

Kukulska-Hulme, A., & Traxler, J. (Eds.). (2005). Mobile learning: A handbook for educators and trainers. Psychology Press

Kumar, S., Gankotiya, A., & Dutta, K. (2011). A comparative study of Moodle with other e-learning systems. Electronics Computer Technology (ICECT), 2011 3rd International Conference on, 5, 414-418.

Lamboy, C. L., & Bucker, A. J. (2003). An Investigation of Faculty Technology Skills in a Puerto Rican University. Quarterly Review of Distance Education, 4(2), 143. Retrieved from http://search.ebscohost.com.er.lib.k-state.edu/login.aspx?direct=true&db=aph&AN=10046977&site=ehost-live

Lane, C., & Lyle, A. (2011). Obstacles and supports related to the use of educational

technologies: The role of technological expertise, gender, and age. Journal of Computing in Higher Education, 23(1), 38-59.

Lazarus, B. (2003). Teaching courses online: How much time does it take. *Journal of Asynchronous Learning Networks: JALN., 7*(3), 47.

Liao, H. (2005). Communication technology, student learning, and diffusion of innovation. *College Quarterly, 8*(2), 18. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/61869793?accountid=11789

Lloyd, S. A., Byrne, M. M., & McCoy, T. S. (2012). Faculty-perceived barriers of online education. Journal of online learning and teaching, 8(1).

Lonn, S., & Teasley, S. D. (2009). Saving time or innovating practice: Investigating perceptions and uses of learning management systems. *Computers & Education, 53*(3), 686-694. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/61860811?accountid=11789

Makarem, S. (2015). Using online video lectures to enrich traditional face-to-face courses. *International Journal of Instruction*, *8*(2), 155.

Malm, E., & Defranco, J. F. (2012). Toward a student-centered measure of learning management system utilization. *Journal of Educational Technology Systems, 40*(4), 401-413. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/1140130085?accountid=11789

Manca, S. (2016). "Yes for sharing, no for teaching!": Social Media in academic practices. The Internet and Higher Education., 29, 63.

McKinley, B., Batiuk, Mary Ellen, Edson, Wendy, & Ionas, Ioan. (2014). The Relationship of Faculty Demographics and Attitudes toward Technology Integration, ProQuest

Dissertations and Theses.

Ministry of Education. (2016). Universities Statistics. Ministry of Education in Saudi Arabia. Retrieved from https://www.moe.gov.sa/en/Pages/default.aspx

Moore, M. G., & Kearsley, G. (2005). *Distance education: A systems view*. San Francisco, CA.

Moukali, K. H. (2012). Factors that affect faculty attitudes toward the adoption of technology rich blended learning at Jazan University in Saudi Arabia (Doctoral dissertation). University of Kansas, Lawrence, KS.

Mwaura, C. (2004). Influence of attributes of innovations on the integration of web-based instruction by faculty members. *Turkish Online Journal of Educational Technology - TOJET, 3(*2), 9. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/1826533835?accountid=11789

Mwenda, M. N. (2010). Underrepresented minority students in STEM doctoral programs: The role of financial support and relationships with faculty and peers Available from ERIC. (881461811; ED521393). Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/881461811?accountid=11789

Nicolle, P. S., & Lou, Y. (2008). Technology adoption into teaching and learning by mainstream university faculty: A mixed methodology study revealing the "how, when, why, and why not." *Journal of Educational Computing Research, 39*(3), 235-265.

North Carolina State University. (2004). Learning in a technology-rich environment: A quality enhancement plan for North Carolina State University. Retrieved from http://litre.ncsu.edu/

Omar, S. (2016). Concerns and professional development needs of faculty at King Saud University in Saudi Arabia in adopting online teaching (Doctoral dissertation). Retrieved

from K-State Research Exchange.

Osika, E. R., Johnson, R. Y., & Buteau, R. (2009). Factors influencing faculty use of technology in online instruction: A case study. O*nline Journal of Distance Learning Administration, 12*(1), 0.

Owusu-Ansah, A., & Southerland, Arthur R. (2001). Institutional Support of Technology-based Distance Education, Faculty Views, and Participation, ProQuest Dissertations and Theses.

Ozkan, H. H. (2010). Cooperative learning technique through internet-based education: A model proposal. Education, 130(3), 499-508.

Paulsen, M. F. (2003). Experiences with learning management systems in 113 European institutions. *Educational Technology & Society, 6(*4), 134-148.

Pereira, A. S., & Wahi, M. M. (2017). Course management system's compatibility with teaching style influences willingness to complete training. *Online Learning, 21*(1), 36-59. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/1913351725?accountid=11789

Petherbridge, D. T. (2007). A concerns-based approach to the adoption of Web-based learning management systems. North Carolina State University. doi: AAT3269445

Potter, J. (2015). Applying a hybrid model: Can it enhance student learning outcomes? *Journal of Instructional Pedagogies*, 17, 11. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/1826543944?accountid=11789

Prensky, M. (2001). Digital natives, digital immigrants part 1. On the Horizon: *The Strategic Planning Resource for Education Professionals*., 9(5), 1.

Rahman, M. (2001). Faculty recruitment strategies for online programs. *The Online Journal of*

Distance Learning Administration. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1804723

Raphael, C., & Mtebe, J. S. (2016). Instructor support services: An inevitable critical success factor in blended learning in higher education in Tanzania. *International Journal of Education and Development using Information and Communication Technology, 12*(2), 123-138. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/1871580826?accountid=11789

Rogers, E.M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: Free Press.

Rubin, B., Fernandes, R., Avgerinou, M. D., & Moore, J. (2010). The effect of learning management systems on student and faculty outcomes. *The Internet and Higher Education, 13*(1), 82– 83. doi:10.1016/j.iheduc.2009.10.008

Ruth, M. L. (1996). Faculty acceptance and resistance: Internet technologies at moorhead state university (Order No. 9711386). Available from ProQuest Dissertations & Theses Global. (304269737). Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/304269737?accountid=11789

Sahin, I. (2005). Understanding faculty adoption of technology using the learning/adoption trajectory model: A qualitative case study. *The Turkish Online Journal of Educational Technology (TOJET), 4*(1).

Sahin, I. (2006). Detailed review of rogers' diffusion of innovations theory and educational technology-related studies based on rogers' theory. *Turkish Online Journal of Educational Technology* - TOJET, 5(2), 10. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/1826532341?accountid=11789

Sahin, I., & Thompson, A. (2006). Using Rogers' Theory to Interpret Instructional Computer Use

by COE Faculty. *Journal of Research on Technology In Education*, 39(1), 81-104.

Sallum, S. A. (2008). Learning Management System Implementation: Building Strategic Change. [Online] Available: http://findarticles.com/p/articles/mi_hb5835/is_200801/ai_n32281677/?tag=content;col1 (Jan 1, 2008)

Samarawickrema, G., & Stacey, E. (2007). Adopting web-based learning and teaching: A case study in higher education. *Distance Education, 28*(3), 313-333. doi:10.1080/01587910701611344

Sanga, M. W. (2016). An analysis of technological issues emanating from faculty transition to a new learning management system. Quarterly Review of Distance Education, 17(1), 11-21. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/1913349959?accountid=11789

Schifter, C. (2002). Perception Differences about Participating in Distance Education. Online Journal of Distance Learning Administration, 5(1), Online Journal of Distance Learning Administration, 2002, Vol.5(1).

Shayo, E., Mwase, C., & Kissaka, M. (2017). Barriers Towards the Adoption of a Practical Training Management System at the University of Dar es Salaam.

Shea, P. (2007). Bridges and barriers to teaching online college courses: A study of experienced online faculty in thirty-six colleges. Journal of Asynchronous Learning Networks,11(2).

Sinclair, J., & Aho, A. (2018). Experts on super innovators: Understanding staff adoption of learning management systems. Higher Education Research & Development, 37(1), 158-172.

Spotts, T., Bowman, H., & Mertz, M. (1997). Gender and use of instructional technologies: A

study of university faculty. Higher Education, 34(4), 421-436.

Tabata, L., & Johnsrud, L. (2008). The impact of faculty attitudes toward technology, distance education, and innovation. *Research in Higher Education, 49*(7), 625-646. doi:10.1007/s11162-008-9094-7

Taylor, J. A., & Newton, D. (2013). Beyond blended learning: A case study of institutional change at an Australian regional university. *Internet and Higher Education*, 18, 54-60. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/1413415572?accountid=11789

Thorne, K. (2003). Blended Learning: How to Integrate Online & Traditional Learning. London: Kogan Page

Uzun, L. (2014). Utilising Technology for Intercultural Communication in Virtual Environments and the Role of English. Procedia - Social and Behavioral Sciences, 116(C), 2407-2411.

Veletsianos, G., & Kimmons, R. (2013). Scholars and faculty members' lived experiences in online social networks. The Internet and Higher Education, 16, 43-50.

Vernadakis, Giannousi, Derri, Michalopoulos, & Kioumourtzoglou. (2012). The impact of blended and traditional instruction in students' performance. Procedia Technology, 1, 439-443.

Wachira, P., & Keengwe, J. (2011). Technology integration barriers: Urban school mathematics teachers perspectives. *Journal of Science Education and Technology, 20*(1), 17-25.

Walker, D. S. (2014). *Attributes and barriers that influence the adoption and diffusion of a learning management system*. (Doctoral dissertation). Texas A&M University. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/1650238935?accountid=11789. (Order No. 3667660)

Wang, Q., Woo, H. L., Quek, C. L., Yang, Y., & Liu, M. (2012). Using the Facebook group as a learning management system: An exploratory study. British Journal of Educational Technology, 43(3), 428-438.

Warner, R. M. (2013). Applied statistics: From bivariate through multivariate techniques (Second Edition). London: SAGE.

Watson, W. R., & Sunnie, L. W. (2007). An argument for clarity: What are learning management systems, what are they not, and what should they become? *Tech Trends*, 51(2), 28-34. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/223124171?accountid=11789

Weisberg, H., Krosnick, J. A., & Bowen, B. D. (1996). *An Introduction to Survey Research, Polling, and Data Analysis.* 3rd ed. Thousand Oaks Calif: Sage Publications.

Welker, J., & Berardino, L. (2005). Blended learning: Understanding the middle ground between traditional classroom and fully online instruction. *Journal of Educational Technology Systems, 34*(1), 33-55.

West, R. E., Waddoups, G., & Graham, C.R. (2007). Understanding the experiences of instructors as they adopt a course management system. *Educational Technology Research and Development, 55*(1), 1-26.

Woods, Baker, & Hopper. (2004). Hybrid structures: Faculty use and perception of web-based courseware as a supplement to face-to-face instruction. *The Internet and Higher Education, 7*(4), 281-297.

Wu, J., Tennyson, R. D., & Hsia, T. (2010). A study of student satisfaction in a blended E-learning system environment. *Computers & Education, 55*(1), 155-164. Retrieved from http://search.proquest.com.er.lib.k-state.edu/docview/742863535?accountid=11789

Yidana, I., Sarfo, F. K., Edwards, A. K., Boison, R., & Wilson, O. A. (2013). Using the Moodle learning management system for teaching and learning at the University of Education, Winneba. *Unlocking the potential of ICT in higher education: Case studies of educational technology initiatives at African universities,* 58-75.

Yun, G. W., & Trumbo, C. W. (2000). Comparative response to a survey executed by post, email, and web form. *Journal of Computer-Mediated Communication,* 6(1). Retrieved from https://academic.oup.com/jcmc/article/6/1/JCMC613/4584225#.WtTd4On06-I.email

Zeleny, M. (2012). High technology and barriers to innovation: From globalization to *relocalization. 11*(02), 441.

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. L. (2002). Conditions for classroom technology innovations. Teachers College Record, 104(3), 482–515

Appendix A - KSU IRB Approval

KANSAS STATE UNIVERSITY | University Research Compliance Office

TO: J. Spencer Clark
Curriculum & Instruction
Bluemont Hall

Proposal Number: 9409

FROM: Rick Scheidt, Chair
Committee on Research Involving Human Subjects

DATE: 8/28/18

RE: Proposal Entitled, "The Adoption of Learning Management Systems (LMS) at Kansas State University"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written – and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: 2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

203 Fairchild Hall, Lower Mezzanine, 1601 Vattier St., Manhattan, KS 66506-1103 | 785-532-3224 | fax: 785-532-3278
comply@k-state.edu | k-state.edu/research/comply

Appendix B - King Saud University Approval

جامعة الملك سعود
King Saud University

عمادة البحث العلمي
مكتب العميد

Ref No : KSU-HE-18-219

سعادة الباحث/ طارق محمد الشعلان المحترم

السلام عليكم ورحمة الله وبركاته،،،

إشارة إلى توصية اللجنة الفرعية للكليات الإنسانية لأخلاقيات البحوث على الكائنات الحية في جلستها السادسة بتاريخ 21/ 02 /1440 هـ الموافق 30 / 10 / 2018 م .

نفيدكم بموافقة اللجنة الدائمة لأخلاقيات البحث العلمي على إجراء البحث الموضح بالجدول الآتي:

م	اسم الباحث	البحث	الحالة
1	طارق محمد الشعلان	"استخدام أعضاء هيئة التدريس لنظام إدارة التعلم بلاك بورد (Blackboard)"	الموافقة

وعليه نأمل من الجهات المعنية بالجامعة تسهيل مهمة الباحث.

وتفضلوا بقبول وافر الاحترام،،،

عميد البحث العلمي

نائب رئيس اللجنة الدائمة لأخلاقيات البحث العلمي

أ.د. خالد بن إبراهيم الحميزي

Appendix C - The Survey

Invitation to Survey Participants

Dear Faculty Member,

My name is Tariq Alshalan, a Ph.D. candidate in the field of Educational Technology, Department of Curriculum and Instruction, College of Education, Kansas State University. I am seeking your help in a survey about transferring the best practices of Kansas State University's faculty members' adoption of a new learning management system (LMS) at Kansas State University to other universities in Saudi Arabia. This study is being conducted as research for my dissertation. This study will investigate the adoption process of learning management system among faculty members. The findings will help give direction to the challenges might face instructors will using LMS.

Your response to this survey will be appreciated. It will take approximately 10 minutes to complete the survey. Your participation is voluntary, and therefore you may discontinue participation at any time without penalty.

The confidentiality of your responses is an ethical issue I will respect in this study. Your professional and personal information is required in anonymous form to protect your individual identity and privacy.

If you have any questions regarding this study or the survey, please contact the researcher, Tariq Alshalan, at alshalan@ksu.edu, or cell phone: 917-935-7077

Thank you for taking the time to complete this task and for your assistance.
Best Regards,

Tariq Alshalan Ph.D. Candidate
Specialist in Educational Technology
Department of Curriculum and Instruction
Kansas State University

- **The first section is about the Rogers' five attributes of Innovation (Relative Advantage, complexity, trialability, observability) and the faculty members' decision to adopt the learning management system.**

1- Relative Advantage:

	Strongly Disagree	Disagree	Neutral /Uncertain	Agree	Strongly Agree
1. Using K-state online (Canvas) enables (would enable) me to significantly improve the overall quality of my teaching	○	○	○	○	○
2. Using K-state online (Canvas) makes (would make) it easier to do my job.	○	○	○	○	○
3. Using K-state online (Canvas) enables (would enable) me to accomplish course management tasks (management course content, assignments, and resources) more efficiently.	○	○	○	○	○
4. Using K-state online (Canvas) is (would be) an efficient use of my time and increases my productivity	○	○	○	○	○
5. K-state online (Canvas) allows (would allow) me greater flexibility and control over my work.	○	○	○	○	○
6. K-state online (Canvas) allows (would allow) me to reach wider audiences	○	○	○	○	○
7. K-state online (Canvas) allows (would allow) me to develop new technological skills.	○	○	○	○	○
8. Using K-state online (Canvas) enables (would enable) me to use technology more innovatively in my teaching.	○	○	○	○	○
9. Using K-state online (Canvas) helps (would help) me plan and improve student teaching.	○	○	○	○	○
10. K-state online (Canvas) allows (would allow) my students to develop greater technological skills.	○	○	○	○	○

11. K-state online (Canvas) allows (would allow) for deeper or more meaningful student learning.	○	○	○	○	○
12. Using K-state online (Canvas) increases (would increase) student access to class information.	○	○	○	○	○
13. Using K-state online (Canvas) encourages (would encourage) student engagement with course content.	○	○	○	○	○
14. Using K-state online (Canvas) increase (would increase) interaction between students and instructor.	○	○	○	○	○
15. The benefits of using the LMS outweigh the hassle factor (related to time and effort required to learn/use the LMS and the potential for frequent frustrations).	○	○	○	○	○

2- Compatibility

	Strongly Disagree	Disagree	Neutral /Uncertain	Agree	Strongly Agree
1. Using K-State Online (Canvas) fits (would fit) well with my teaching style.	○	○	○	○	○
2. Using K-State Online (Canvas) support (would support) my philosophy of teaching.	○	○	○	○	○
3. Using the K-State Online (Canvas) is (would be) compatible with my students' needs.	○	○	○	○	○
4. Using K-State Online (Canvas) is compatible with the resources I am currently using in my course(s).	○	○	○	○	○
5. I feel (would feel) comfortable using K-State Online (Canvas).	○	○	○	○	○
6. Using K-State Online (Canvas) (would be) compatible with most aspects of my teaching.	○	○	○	○	○

7. Using t K-State Online (Canvas) for academic purposes is (would be) compatible with all religious and cultural aspects of my work.	○	○	○	○	○
8. Courses utilizing online technologies such as K-State Online (Canvas) are equal or superior in quality to these that do not.	○	○	○	○	○
9. The lack of direct interpersonal contact and feedback from Students does (would) not present a problem.	○	○	○	○	○
10. K-State Online (Canvas) is (would be) compatible with my level of technology expertise and experience.	○	○	○	○	○

3- Complexity

	Strongly Disagree	Disagree	Neutral /Uncertain	Agree	Strongly Agree
1. Learning to use K-State Online (Canvas) is (would be) easy for me.	○	○	○	○	○
2. I find (would find) it simple to manage my course and student data using K-State Online (Canvas).	○	○	○	○	○
3. I can (could) easily integrate K-State Online (Canvas) into my courses.	○	○	○	○	○
4. I do not find (would not find) it difficult to add content to K-State Online (Canvas).	○	○	○	○	○
5. I find (would find) it easy to modify K-State Online (Canvas) course design.	○	○	○	○	○
6. I am (would find) it easy to use the Grade Center.	○	○	○	○	○
7. I am (would be) able to use the communication tools quickly and easily.	○	○	○	○	○
8. I am (would be) able to easily use the test/survey features in K-State Online	○	○	○	○	○

(Canvas).					
9. I am (would be) able to easily utilize the group collaboration functions in K-State Online (Canvas).	○	○	○	○	○
10. It is (would be) easy for me to remember how to perform tasks in K-State Online (Canvas).	○	○	○	○	○

4- Trialability

	Strongly Disagree	Disagree	Neutral /Uncertain	Agree	Strongly Agree
1. I was permitted to use K-State Online (Canvas) on a trial basis long enough to see what it could/can do.	○	○	○	○	○
2. A site is available to me to try out various tools and components of K-State Online (Canvas) before using them in my courses.	○	○	○	○	○
3. Before deciding whether to use any of the K-State Online (Canvas) tools/features. I am (would be) able to experiment with their use.	○	○	○	○	○
4. I can try out individual features of K-State Online (Canvas) at my own pace.	○	○	○	○	○
5. I am aware of opportunities to try out various uses of K-State Online (Canvas).	○	○	○	○	○
6. Being able to try out features of the LMS is important to me.	○	○	○	○	○

5- Observability

	Strongly Disagree	Disagree	Neutral /Uncertain	Agree	Strongly Agree
1. I have observed how other teachers are using the K-State Online (Canvas) in their teaching.	○	○	○	○	○

2. Many of my colleagues use the K-State Online (Canvas).	○	○	○	○	○
3. I have seen or heard about students using the K-State Online (Canvas) for another instructor's course.	○	○	○	○	○
4. The results of using the K-State Online (Canvas) are apparent to me.	○	○	○	○	○
5. I would be able to explain why using the K-State Online (Canvas) may or may not be beneficial.	○	○	○	○	○

- **The second section is about the relationship between the adoption decision of faculty members and their perception of the organizational support related to the adoption of the learning management system.**

	Strongly Disagree	Disagree	Neutral /Uncertain	Agree	Strongly Agree
1. Using the K-State Online (Canvas) fit into my institution's vision, mission, and goals.	○	○	○	○	○
2. My institution provides the technical infrastructure to support using the K-State Online (Canvas) in my courses.	○	○	○	○	○
3. I am adequately rewarded/compensated for incorporating the K-State Online (Canvas) in my teaching practices.	○	○	○	○	○
4. Using the K-State Online (Canvas) enhances my ability to achieve tenure and promotion.	○	○	○	○	○
5. Technological skills/using the K-State Online (Canvas) are important when making hiring/tenure decisions.	○	○	○	○	○

6. My institution has communication its strategic plan for the implementation of the K-State Online (Canvas) in teaching practices.	○	○	○	○	○
7. I feel included in the dialogue about technology and distances education initiatives.	○	○	○	○	○
8. The procedure for establishing course web sites using the K-State Online (Canvas) encourages faculty use of the system.	○	○	○	○	○
9. I am generally satisfied with the responses or resolution to problem(s) with the K-State Online (Canvas).	○	○	○	○	○
10. My institution provides professional development activities to help faculty learn and use the K-State Online (Canvas).	○	○	○	○	○
11. Professional development activities related to the K-State Online (Canvas) have been effective.	○	○	○	○	○
12. The goals and objectives regarding use of the K-State Online (Canvas) are shared by faculty as well as administration.	○	○	○	○	○
13. My supervisor supports/encourages the use of the K-State Online (Canvas).	○	○	○	○	○
14. My colleagues think that I should use the K-State Online (Canvas) for my course work.	○	○	○	○	○
15. People in my institution who use the K-State Online (Canvas) have more prestige than those who do not.	○	○	○	○	○
16. Using the K-State Online (Canvas) improve my image within my department or the institution.	○	○	○	○	○

17. Innovativeness and experimentation are encouraged at my institution	○	○	○	○	○
18. In terms of using the K-State Online (Canvas), it is important to me to consider what my peers think.	○	○	○	○	○
19. In terms of using the K-State Online (Canvas), it is important to me to consider what my students think.	○	○	○	○	○

- **Section three about the (time concern and fear of change of new technology) and learning management systems usage.**

1- Time concern

	Strongly Disagree	Disagree	Neutral/ Uncertain	Agree	Strongly Agree
1. Having a course in the K-State Online (Canvas) platform requires more of my time than a traditional course.	○	○	○	○	○
2. Training on how to use the K-State Online (Canvas) requires extra time out of my schedule.	○	○	○	○	○
3. It is important that the K-State Online (Canvas) have mobile access so I can get my course content anytime and anywhere.	○	○	○	○	○
4. Using K-State Online (Canvas) allows me to do other things that a traditional course would not.	○	○	○	○	○
5. Taking course in the K-State Online (Canvas) helps me manage my time better.	○	○	○	○	○

2- Fear of change and new technology

	Strongly Disagree	Disagree	Neutral /Uncertain	Agree	Strongly Agree
1. Changes in K-State Online (Canvas) negatively affect teaching and learning.	○	○	○	○	○
2. I prefer face-to-face courses to online courses if the e-Learning platform is too complex to use.	○	○	○	○	○
3. Privacy of assignments and is threatened when using a K-State Online (Canvas).	○	○	○	○	○
4. Using a K-State Online (Canvas)for teaching and learning create isolation between the student and instructor.	○	○	○	○	○
5. I feel that using new technology such as a K-State Online (Canvas) provides a better environment to learn.	○	○	○	○	○

- **Section four: Demographic Information**

Age

- ○ 23 - 30
- ○ 31 - 40
- ○ 41 -50
- ○ 51 - 60
- ○ More than 61

Gender

- ○ Male
- ○ Female
- ○ Prefer not to answer

Years of Teaching Experience

- ○ 1 - 3
- ○ 4 - 10
- ○ 11 - 20
- ○ More than 21

College

- ○ Colleges of Humanities
- ○ Colleges of Sciences
- ○ Colleges of Health
- ○ Others

Academic Rank

- ○ Professor
- ○ Associate Professor
- ○ Assistant Professor
- ○ Lecturer
- ○ Graduate Teaching Assistant
- ○ Others

KANSAS STATE UNIVERSITY

العربية

استخدام أعضاء هيئة التدريس لنظام إدارة التعلم بلاك بورد Blackboard

---

دعوة للمشاركة في الاستبانة

عزيزي عضو/عضوة هيئة التدريس في جامعة الملك سعود

أنا أحد مبتعثي جامعة الملك سعود إلى جامعة ولاية كانساس لدراسة الدكتوراه في مجال تقنيات التعليم. وأسعى للحصول على مساعدتك لإكمال استطلاع حول استخدام و تصورات أعضاء هيئة التدريس لنظام إدارة التعلم بلاك بورد (Blackboard). تعرف عمادة التعاملات الالكترونية والاتصالات بجامعة الملك سعود نظام إدارة التعلم بلاك بورد : بأنه نظام إلكتروني لإدارة التعلم عبر الإنترنت، يتيح النظام أدوات اتصال متزامنة وغير متزامنة تتيح تواصل الطلاب مع المعلمين ومع زملائهم فضلا عن قيام النظام بتقديم المقررات التعليمية التي يرفعها المعلم إلكترونيا للطلاب وإدارة الأنشطة والاختبارات وإصدار تقارير عن أداءهم، وتستخدم العمادة نظام Blackboard في إدارة التعلم كما تقوم بعمل الصيانة له وتقدم الدعم الفني لمستخدميه.

وهذا الاستطلاع جزء من دراسة يتم إجراؤها كبحث لأطروحتي. وستبحث هذه الدراسة في استخدام نظام إدارة التعلم بين أعضاء هيئة التدريس. وسوف تقارن الدراسة بين تصورات أعضاء هيئة التدريس في جامعة ولاية كانساس مع أعضاء هيئة التدريس في جامعة الملك سعود.

إن مشاركتك في هذه الاستبانة في غاية الأهمية ، لأنها ستثري هذا البحث، و تضيف إليه قيمة علمية.علماً أن هذا الاستطلاع سوف يأخذ منك بضع دقائق. و سيتم التعامل مع جميع المعلومات المقدمة في هذه الاستبانة بشكل سري، و ستستخدم فقط لأغراض البحث.

إذا كان لديك أي أسئلة بخصوص هذه الدراسة أو الاستطلاع ، يرجى الاتصال بالباحث طارق الشعلان على alshalan@ksu.edu أو الهاتف الخلوي: ٩١٧٩٣٥٧٠٧٧

مع شكري و تقديري لسعادتكم على اقتطاع جزء من وقتكم الثمين لتعبئة هذه الاستبانة
طالب الدكتوراه/ طارق الشعلان
متخصص في تقنيات التعليم
كلية التربية
جامعة ولاية كانساس

KANSAS STATE UNIVERSITY

العربية

القسم الأول يتعلق بخواص روجرز الخمسة للابتكار (الميزة النسبية ، والتعقيد ، وقابلية التنفيذ ، والملاحظة) وقرار أعضاء هيئة التدريس اعتماد نظام إدارة التعلم.

1 - الميزة النسبية: درجة النظر إلى الابتكار على أنه أفضل من الفكرة السابقة او القديمة.

	موافق بشدة	أوافق	محايد / غير مؤكد	لا أوافق	لا أوافق بشدة
إن استخدام نظام إدارة التعلم (Blackboard) يمكنني من تحسين الجودة الإجمالية لتدريسي بشكل ملحوظ	○	○	○	○	○
باستخدام نظام إدارة التعلم (Blackboard) يجعل من السهل القيام بعملي.	○	○	○	○	○
إن استخدام نظام إدارة التعلم (Blackboard) يمكنني من إنجاز مهام إدارة المقرر الدراسي (محتوى المقرر ، والمهام ، والموارد) بشكل أكثر كفاءة.	○	○	○	○	○
باستخدام نظام إدارة التعلم (Blackboard) سيكون استخدام فعالًا لوقتي ويزيد من إنتاجي	○	○	○	○	○
يسمح نظام إدارة التعلم (Blackboard) بالمزيد من المرونة والتحكم في أعمالي.	○	○	○	○	○
يتيح نظام إدارة التعلم (Blackboard) الوصول إلى جمهور أوسع	○	○	○	○	○
يسمح نظام إدارة التعلم (Blackboard) بتطوير مهارات تكنولوجية جديدة.	○	○	○	○	○
إن استخدام نظام إدارة التعلم (Blackboard) يمكنني من استخدام التكنولوجيا بشكل أكثر إبداعًا في التدريس.	○	○	○	○	○
يساعد استخدام نظام إدارة التعلم (Blackboard) في تخطيط وتحسين تعليم الطلاب.	○	○	○	○	○

يسمح نظام إدارة التعلم (Blackboard) بتطوير مهارات تكنولوجية جديدة.	○	○	○	○	○
إن استخدام نظام إدارة التعلم (Blackboard) يمكّنني من استخدام التكنولوجيا بشكل أكثر إبداعًا في التدريس.	○	○	○	○	○
يساعد استخدام نظام إدارة التعلم (Blackboard) في تخطيط وتحسين تعليم الطلاب.	○	○	○	○	○
يسمح نظام إدارة التعلم (Blackboard) لطلاب بتطوير مهارات تكنولوجية أكبر.	○	○	○	○	○
يتيح نظام إدارة التعلم (Blackboard) لطلاب التعليم بشكل أعمق او ذي معنى.	○	○	○	○	○
يزيد استخدام نظام إدارة التعلم (Blackboard) وصول الطلاب إلى معلومات المقرر الدراسي.	○	○	○	○	○
إن استخدام نظام إدارة التعلم (Blackboard) يشجع تفاعل الطلاب مع محتوى المقرر الدراسي.	○	○	○	○	○
استخدام نظام إدارة التعلم (Blackboard) يساعد في زيادة التفاعل بين الطلاب والمعلم.	○	○	○	○	○
فوائد استخدام نظام إدارة التعلم (Blackboard) تفوق المجهود و التعب (فيما يتعلق بالوقت والجهد المطلوب لتعلم استخدام نظام إدارة التعلم).	○	○	○	○	○

KANSAS STATE UNIVERSITY

العربية

2 - التوافق: درجة النظر إلى الابتكار على أنه متسق مع القيم الحالية والتجارب الماضية واحتياجات المتبنين المحتملين.

	موافق بشدة	أوافق	محايد / غير مؤكد	لا أوافق	لا أوافق بشدة
استخدام نظام إدارة التعلم (Blackboard) يتناسب بشكل جيد مع أسلوب التدريس الخاص بي.	○	○	○	○	○
يدعم استخدام نظام إدارة التعلم (Blackboard) فلسفتي في التدريس.	○	○	○	○	○
إن استخدام نظام إدارة التعلم (Blackboard) متوافقًا مع احتياجات طلابي.	○	○	○	○	○
إن استخدام نظام إدارة التعلم (Blackboard) متوافقًا مع المصادر التعليمية التي أستخدمها حاليًا في المقررات الدراسية الخاصة بي.	○	○	○	○	○
أشعر بالارتياح باستخدام نظام إدارة التعلم (Blackboard) .	○	○	○	○	○
استخدام نظام إدارة التعلم (Blackboard) سيكون متوافق مع معظم جوانب التدريس.	○	○	○	○	○
إن استخدام نظام إدارة التعلم (Blackboard) للأغراض الأكاديمية متوافقًا مع جميع الجوانب الدينية والثقافية في أعمالي.	○	○	○	○	○
تعتبر المقررات التي يتم أستخدام تقنيات الإنترنت مثل نظام إدارة التعلم (Blackboard) متساوية أو عالية الجودة بالنسبة لتلك التي لاتستخدم.	○	○	○	○	○
عدم وجود الاتصال المباشر مع الطلاب و معرفة وردود فعلهم لا يمثل مشكلة بالنسبة لي.	○	○	○	○	○
نظام إدارة التعلم (Blackboard) متوافق مع مستواي وخبرتي في مجال التكنولوجيا.	○	○	○	○	○

KANSAS STATE UNIVERSITY

العربية

3- التعقيد: درجة النظر إلى الابتكار باعتباره من الصعب فهمه واستخدامه

	موافق بشدة	أوافق	محايد / غير مؤكد	لا أوافق	لا أوافق بشدة
إن تعلم استخدام نظام إدارة التعلم (Blackboard) سهل بالنسبة لي.	○	○	○	○	○
أجد أنه من السهل إدارة المقرر التعليمي وبيانات الطلاب باستخدام نظام إدارة التعلم (Blackboard) .	○	○	○	○	○
يمكنني بسهولة دمج نظام إدارة التعلم (Blackboard) في المقرر التعليمي.	○	○	○	○	○
لن أجد صعوبة في إضافة محتوى إلى نظام إدارة التعلم (Blackboard) .	○	○	○	○	○
أجد أنه من السهل تعديل نظام إدارة التعلم (Blackboard) و تصميم المقرر التعليمي.	○	○	○	○	○
أجد أنه من السهل رصد درجات الطلاب باستخدام نظام إدارة التعلم (Blackboard) .	○	○	○	○	○
أنا قادر على استخدام أدوات الاتصال بسرعة وسهولة.	○	○	○	○	○
يمكنني بسهولة أن استخدام ميزة الاختبارات الموجودة في نظام إدارة التعلم (Blackboard).	○	○	○	○	○
يمكنني بسهولة استخدام ميزة العمل الجماعي في نظام إدارة التعلم (Blackboard) .	○	○	○	○	○
سيكون من السهل بالنسبة لي أن أتذكر كيفية أداء المهام في نظام إدارة التعلم (Blackboard) .	○	○	○	○	○

→ ←

KANSAS STATE UNIVERSITY

العربية

4- التجربة: الدرجة التي يمكن بها تجربة الابتكار على أساس محدودو ليس بشكل كامل.

	موافق بشدة	أوافق	محايد / غير مؤكد	لا أوافق	لا أوافق بشدة
اتيحت لي فرصة استخدام نظام إدارة التعلم (Blackboard) بشكل تجريبي بما يكفي لمعرفة مكونات النظام، وما يمكن القيام به.	○	○	○	○	○
يتوفر لي موقع لتجربة الأدوات والمكونات المختلفة لـنظام إدارة التعلم (Blackboard) قبل استخدامها في المقررات التعليمية الخاصة بي.	○	○	○	○	○
قبل اتخاذ قرار بشأن استخدام أي من أدوات وميزات نظام إدارة التعلم (Blackboard) أنا قادر على تجربة استخدامها.	○	○	○	○	○
يمكنني تجربة الميزات الفردية لـ نظام إدارة التعلم (Blackboard) وفقًا للقدرات الخاصة بي.	○	○	○	○	○
أنا على دراية بالفرص المتاحة لتجربة الاستخدامات المختلفة لـ نظام إدارة التعلم (Blackboard) .	○	○	○	○	○
إن القدرة على تجربة ميزات نظام إدارة التعلم (Blackboard) أمر مهمة بالنسبة لي.	○	○	○	○	○

KANSAS STATE UNIVERSITY

العربية

5- الملاحظة: الدرجة التي تكون فيها نتائج الابتكار مرئية للآخرين .

	موافق بشدة	أوافق	محايد / غير مؤكد	لا أوافق	لا أوافق بشدة
لقد لاحظت كيف يستخدم زملائي/ زميلاتي نظام إدارة التعلم (Blackboard) في تعليمهم.	○	○	○	○	○
يستخدم العديد من زملائي/زميلاتي نظام إدارة التعلم (Blackboard).	○	○	○	○	○
لقد رأيت أو سمعت عن الطلاب الذين يستخدمون نظام إدارة التعلم (Blackboard) لمقرارات أخرى.	○	○	○	○	○
نتائج استخدام نظام إدارة التعلم (Blackboard) واضحة بالنسبة لي.	○	○	○	○	○
سأكون قادر على توضيح ما اذا كان استخدام نظام إدارة التعلم (Blackboard) مفيداً أوغير مفيداً.	○	○	○	○	○

العربية

القسم الثاني يتعلق بالعلاقة بين قرار تبني أعضاء هيئة التدريس وفهمهم للدعم التنظيمي المتعلق بتبني نظام إدارة التعلم.

الدعم التنظيمي المتعلق بنظام إدارة التعلم

	موافق بشدة	أوافق	محايد / غير مؤكد	لا أوافق	لا أوافق بشدة
استخدام نظام إدارة التعلم (Blackboard) يتناسب مع رؤية ورسالة وأهداف جامعتي.	○	○	○	○	○
توفر الجامعة البنية التحتية التقنية، و لدعم الفني لأجل استخدام نظام إدارة التعلم (Blackboard) في المقررات التعليمية.	○	○	○	○	○
أحصل على التشجيع الكافي لإدخال نظام إدارة التعلم (Blackboard) في طريقة التدريس الخاصة بي.	○	○	○	○	○
إن استخدام نظام إدارة التعلم (Blackboard) يعزز قدرتي للحصول على منصب والترقية.	○	○	○	○	○
المهارات التكنولوجية مثل استخدام نظام إدارة التعلم (Blackboard) مهم عند اتخاذ قرارات التوظيف اوالترقيات.	○	○	○	○	○
لدى جامعتي خطة استراتيجية لتنفيذ نظام إدارة التعلم (Blackboard) في طرق التدريس.	○	○	○	○	○
أشعر أنني مشارك في الحوار حول التقنية و مبادرات التعليم عن بعد.	○	○	○	○	○
إجراءات تصميم المقرر التعليمي على نظام أدارة التعلم (Blackboard) تشجع أعضاء هيئة التدريس على استخدام النظام.	○	○	○	○	○
أنا راضي بشكل عام عن الحلول للمشكلات مع نظام إدارة التعلم (Blackboard)	○	○	○	○	○
تقدم جامعتي أنشطة التطوير المهني لمساعدة أعضاء هيئة التدريس على تعلم واستخدام نظام إدارة التعلم (Blackboard).	○	○	○	○	○
كانت أنشطة التطوير المهني المتعلقة بنظام إدارة التعلم (Blackboard) فعّالة.	○	○	○	○	○
يتم مشاركة الأهداف والغايات المتعلقة باستخدام نظام إدارة التعلم (Blackboard) من قبل أعضاء هيئة التدريس والإدارة.	○	○	○	○	○
رئيسي/رئيستي في العمل يدعم و يشجع استخدام نظام إدارة التعلم (Blackboard).	○	○	○	○	○
يعتقد زملائي/زميلاتي أنني يجب أن استخدم نظام إدارة التعلم (Blackboard) لإنجاز مهام المقرر الدراسي.	○	○	○	○	○
في جامعتي الأشخاص الذين يستخدمون نظام إدارة التعلم (Blackboard) لديهم مكانة أكثر من أولئك الذين لا يفعلون ذلك.	○	○	○	○	○
أن استخدام نظام إدارة التعلم (Blackboard) يعمل على تحسين صورتي داخل القسم أو الجامعة.	○	○	○	○	○
يتم تشجيع الابتكار والتجارب في جامعتي	○	○	○	○	○
من المهم بالنسبة لي عند استخدام نظام إدارة التعلم (Blackboard) أن أفكر فيما يعتقده زملائي/ زميلاتي.	○	○	○	○	○
من المهم بالنسبة لي عند استخدام نظام إدارة التعلم (Blackboard) التفكير في ما يفكر به طلابي/ طالباتي.	○	○	○	○	○

KANSAS STATE UNIVERSITY

العربية

القسم الثالث عن تأثير (قلق من الوقت والخوف من تغيير التكنولوجيا الجديدة) واستخدام نظم إدارة التعلم.

1- القلق من الوقت

	موافق بشدة	موافق	محايد / غير مؤكد	لا أوافق	لا أوافق بشدة
المقرر الدراسي على نظام إدارة التعلم (Blackboard) يتطلب وقت أكثر من المقرر التقليدية.	○	○	○	○	○
يتطلب التدريب على كيفية استخدام نظام إدارة التعلم (Blackboard) وقتًا إضافيًا على الجدول أعمالي.	○	○	○	○	○
من المهم أن يدعم نظام إدارة التعلم (Blackboard) استخدام الهاتف المحمول حتى أتمكن من الوصول إلى محتوى مقرراتي التعليمية في أي وقت وفي أي مكان.	○	○	○	○	○
إن استخدام منصة نظام إدارة التعلم (Blackboard) يتيح لي مرونة أكثر لا تتوفر في المقررات المقدمة بشكل التقليدية.	○	○	○	○	○
تقديم المقرر الدراسي باستخدام نظام إدارة التعلم (Blackboard) يساعدني على إدارة وقتي بشكل أفضل.	○	○	○	○	○

KANSAS STATE UNIVERSITY

العربية

2- الخوف من التغيير في التكنولوجيا الجديدة

	موافق بشدة	موافق	محايد / غير مؤكد	لا اوافق	لا أوافق بشدة
تؤثر التغيرات/ التعديلات في نظام إدارة التعلم (Blackboard) سلبًا على التدريس والتعلم.	○	○	○	○	○
أنا أفضل تدريس المقررات وجهًا لوجه على التدريس عبر الإنترنت اذا كان نظام إدارة التعلم (Blackboard) معقدًا للغاية ولا يمكن استخدامه.	○	○	○	○	○
تعتبر الخصوصية في اتمام المهام والواجبات من المخاوف التي تواجهني عند استخدام نظام إدارة التعلم (Blackboard).	○	○	○	○	○
إن استخدام نظام إدارة التعلم (Blackboard) للتعليم والتعلم يخلق عزلة بين الطالب والمعلم.	○	○	○	○	○
أشعر أن استخدام التكنولوجيا الجديدة مثل نظام إدارة التعلم (Blackboard) يوفر بيئة أفضل للتعلم.	○	○	○	○	○

KANSAS STATE UNIVERSITY

العربية

البيانات التعريفية للمشاركين:

العمر

- 30 - 23
- 40 - 31
- 50 - 41
- 60 - 51
- أكثر من 61

الجنس

- ذكر
- أنثى

سنوات الخبرة في التدريس

- 3 - 1
- 10 - 4
- 20 - 11
- أكثر من 21

الكلية

- كليات العلوم (الهندسة ، العلوم ، الأغذية والزراعة ، علوم الحاسب والمعلومات ، الهندسة المعمارية والتخطيط ، إدارة الأعمال)
- كليات العلوم الإنسانية (التربية ، الفنون ، القانون والعلوم السياسية ، اللغات والترجمة ، السياحة والآثار ، علوم الرياضة)
- كليات العلوم الصحة
- اخرى

الرتبة الأكاديمية

- أستاذ دكتور
- أستاذ مشارك
- أستاذ مساعد
- محاضر
- معيد